Nutrient Media

When unsealing an ampoule with a culture obtained from the All-Russian Collection of Microorganisms (VKM) and for initial reinoculations, it is recommended to use the medium specified for the strain in the Catalogue.

General comments to the descriptions of the media

1. In all cases when the composition of a medium is given as the description of particular solutions, this implies that the given solutions should be sterilized separately and mixed upon sterilization.
2. In all cases, besides when specified otherwise, a given mode of sterilization assumes autoclaving. If the sterilization conditions of a medium are not specified, they can be set arbitrarily within the limits accepted in the general microbiological practice.
3. The purity of the reagents is not specified in the descriptions. It is assumed that the respective reagents will be used, specifically, peptone, tryptone, yeast extract, etc. marked 'Bacto' or 'For microbiological work'. For some media, descriptions for preparing the components are given instead of using commercial concentrates.
4. The pH values given indicate the magnitudes, which a medium shall have prior to inoculation. In the cases when some solutions are described and errors are possible, it is specified: pH of the medium. An insufficiently alkaline medium shall be alkalized, usually with a sterile solution of NaOH or $NaHCO_3$; an insufficiently acidic one should be acidified, usually with a sterile solution of HCl.

1. *ALLOMONAS ENTERICA* MEDIUM
Peptone 10.0 g
NaCl 20.0 g
Beef extract 5.0 g*
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.
*Beef extract may be replaced with 3.0 g yeast extract.

2. YEAST WATER
Pressed yeast 200.0 g
Tap water 1000.0 ml
Preparation of yeast water: suspend 200.0 g of pressed yeast in 1000.0 ml of tap water and boil for 30 min. Twice filter hot through a paper filter or centrifuge.
Autoclave at 121°C for 15 min.

3. POTATO AGAR
Potato 200.0 g
Agar 20.0 g
Tap water 1000.0 ml
Boil 200.0 g scrubbed and sliced potatoes in 1000.0 ml water for 1 hour, filter cold through a cotton-gauze filter, fill up distilled water to 1000.0 ml, add agar. Do not use new potatoes.
pH 7.0
Autoclave at 121°C for 15 min.

4. WORT AGAR
Wort extract (malt extract) 20.0 g
Agar 20.0 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.

5. PEPTONE MEAT AGAR

Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

6. PEPTONE MEAT BROTH
Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

7. OATMEAL AGAR (OA)
Oatmeal 30.0 g
Agar 15.0 g
Tap water 1000.0 ml
Cook 30.0 g of oatmeal in 1000.0 ml tap water for 20 min, filter through 2 layers of gauze, dilute to 1000.0 ml and add 15.0 g agar.
Autoclave at 121°C for 15 min.

8. PEPTONE MAIZE AGAR
Peptone 5.0 g
Maize extract 5.0 g
Starch (soluble) 10.0 g
NaCl 5.0 g
$CaCl_2$ 0.5 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

9. MALT AGAR 7 BALLING (MA7B)
Malt extract Balling 7 degrees 1000.0 ml
Agar 20.0 g
Adjust pH to 7.0
Autoclave at 111°C for 30 min.

10. MALT AGAR 2 BALLING (MA2B)
Malt extract Balling 2 degrees 1000.0 ml
Agar 20.0 g
Autoclave at 111°C for 30 min.

11. MALT AGAR 3.5 BALLING (MA3.5B)
Malt extract Balling 3.5 degrees 1000.0 ml
Agar 20.0 g
Autoclave at 111°C for 30 min.

12. CZAPEK MEDIUM (CZ)
$NaNO_3$ 3.0 g
K_2HPO_4 1.0 g

KCl 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.01 g
Sucrose 30.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 6.0
Autoclave at 121°C for 30 min.

13. POTATO-GLUCOSE AGAR (PDA)
Grated potato 200.0 g
Glucose 20.0 g
Agar 20.0 g
Tap water 1000.0 ml
Boil 200g scrubbed and sliced potatoes in 1000.0 ml water for 1 hour, filter cold through a cotton-gauze filter, add water to the initial volume, add glucose and agar. Do not use new potatoes.
pH 6.5-7.0
Autoclave at 121°C for 15 min.

14. POTATO-CARROT AGAR (PCA)
Grated potato 20.0 g
Grated carrot 20.0 g
Agar 20.0 g
Tap water 1000.0 ml
Boil potato and carrot in 1000.0 ml of water for 1 h, filter cold through a cotton-gauze filter, add water to the initial volume and add agar. Do not use new potatoes.
pH 7.0-7.1
Autoclave at 121°C for 15 min.

15. LB MEDIUM
Tryptone 10.0 g
Yeast extract 5.0 g
NaCl 10.0 g
Tap water 1000.0 ml
pH 7.5
Autoclave at 121°C for 15 min.

16. YT MEDIUM
Tryptone 8.0 g
Yeast extact 5.0 g
NaCl 5.0 g
Tap water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

17. GLUCOSE PEPTONE AGAR (GPA)
Glucose 40.0 g
Peptone 10.0 g
Yeast extract 5.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

18. GLUCOSE PEPTONE AGAR WITH 5% NaCl
Glucose 40.0 g
Peptone 10.0 g
Yeast extract 5.0 g
NaCl 50.0 g
Agar 20.0 g
Distilled water 1000.0 ml
Autoclave at 111°C for 30 min.

19. MALT AGAR 7 BALLING WITH 5% NaCl (MA7B+5% NaCl)
Malt extract Balling 7 degrees 1000.0 ml
NaCl 50.0 g
Agar 20.0 g
Autoclave at 111°C for 30 min.

20. LIESKE MEDIUM
Mn-acetate 0.1 g
Agar 15.0 g
Distilled water 1000.0 ml
Autoclave at 111°C for 30 min.

21. MANNITOL AGAR WITH YEAST WATER
Mannitol 10.0 g
Agar 15.0 g
Yeast water 100.0 ml
Tap water 900.0 ml
Preparation of yeast water: suspend 200.0 g of pressed yeast in 1000.0 ml of tap water. Twice filter hot through a paper filter or centrifuge.
Autoclave at 121°C for 15 min.

22. MALT AGAR 3.5 BALLING WITH 60% SUCROSE (MA60S)
Malt extract Balling 3.5 degrees 1000.0 ml
Sucrose 600.0 g
Agar 20.0 g
Autoclave at 121°C for 15 min.

23. MALT AGAR 3.5 BALLING WITH 40% SUCROSE (MA40S)
Malt extract Balling 3.5 degrees 1000.0 ml
Sucrose 400.0 g
Agar 20.0 g
Autoclave at 121°C for 15 min.

24. MALT AGAR 3.5 BALLING WITH 20% SUCROSE (MA20S)
Malt extract Balling 3.5 degrees 1000.0 ml
Sucrose 200.0 g
Agar 20.0 g
Autoclave at 121°C for 15 min.

25. MALT AGAR 3.5 BALLING WITH FILTER PAPER
Malt extract Balling 3.5 degrees 1000.0 ml
Agar 20.0 g
Autoclave at 121°C for 15 min.
Sterilize filter paper strips with dry heat and soak it with sterile medium.

26. MANURE AGAR
Horse manure 100-125 g
Agar 25.0 g
Distilled water 1000.0 ml
pH 6.5-7.0
Boil manure in 1000.0 ml of water for 10 min, then keep for 16-20 hours, filter through 1-2 layers of filter paper, adjust to the initial volume, add agar.
Autoclave at 121°C for 15 min.

27. PEPTONE LACTOSE AGAR
Peptone 10.0 g
Lactose 10.0 g
Agar 15.0 g
Tap water 1000.0 ml
Autoclave at 121°C for 15 min.

28. TRYPTOSE AGAR
Tryptose 20.0 g
Glucose 1.0 g
NaCl 5.0 g
Agar 15.0 g
Thiamine-HCl 0.0 5 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.

29. PEA AGAR
Yellow peas 100.0 g
K_2HPO_4 0.5 g
Sucrose 10.0 g
Agar 20.0 g
Tap water 1000.0 ml
Boil peas in 1000.0 ml of water, filter through gauze, add water to the initial volume; add phosphate, sucrose and agar.
Autoclave at 121°C for 15 min.

30. *AZOTOBACTER* MEDIUM 1
Glucose 5.0 g
Mannitol 5.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$MgSO4 \times 7\ H_2O$ 0.1 g
$Na_2MoO_4 \times 2\ H_2O$ 5.0 mg
K_2HPO_4 0.9 g
KH_2PO_4 0.1 g
$FeSO_4 \times 7\ H_2O$ 0.01 g
$CaCO_3$ 5.0 g
Agar 15.0 g
Distilled water 950.0 ml
pH 7.3
Autoclave at 121°C for 15 min.
Sterilize glucose and mannitol separately (in 50.0 ml H_2O) and add to the medium after autoclaving.

31. CABBAGE AGAR
Cabbage 50.0 g
Glucose 20.0 g

Peptone 10.0 g
Agar 20.0 g
Tap water 1000.0 ml
Boil 50.0 g of cabbage in 1000.0 ml of water, filter cabbage and adjust the volume of broth to the initial value.
pH 7.0
Autoclave at 111°C for 30 min.

32. CURD DECOCTION
Pour 9000.0 ml of distilled water into 3.0 kg of curd and add 150.0 of dry *Aspergillus terricola* mycelium, shake, pour chloroform, seal with a stopper. Decoct at 37°C for 10 days, adjust pH to 7.0 with 1 N NaOH. The decoction shall contain 400 mg% amine nitrogen and 300 mg% tryptophan.

33. PEPTONE MEAT AGAR WITH 0.2% UREA
Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
Agar 20.0 g
Distilled water 1000.0 ml
Do not adjust pH; pH raises to about 8 due to heat degraded urea.
Autoclave at 121°C for 15 min.
10.0 ml filter-sterilized 20% urea solution is added aseptically after autoclaving to 1000.0 ml cooled, molten, agar. The medium is then immediately dispensed aseptically.

34. SOIL EXTRACT
Dry garden soil, rich in organic material, in the air by spreading in a thin layer, comminuting and stirring. Then sieve through a rough sieve, and mix 400 g of soil with 960 ml of tap water. Autoclave at 121°C for 1 hour at the end of the day but leave the autoclave open overnight. Filter the cooled extract through filter paper, autoclave 300 ml of filtrate at 121°C for 20 min and allow to stay for 2 weeks or longer to settle the sediment. Decant the clear supernatant liquid and use to prepare the medium.

35. *NITROBACTER* MEDIUM 1
Solution 1 (see below) 0.5 ml
Solution 2 (see below) 0.5 ml
Solution 3 (see below) 1.0 ml
Solution 4 (see below) 0.5 ml
Solution 5 (see below) 0.5 ml
Solution 6 (see below) 0.1 ml
Distilled water to 1000.0 ml
Solution 1:
$CaCl_2$ 2.0 g
Distilled water 100.0 ml
Solution 2:
$MgSO_4 \times 7\ H_2O$ 20.0 g
Distilled water 100.0 ml
Solution 3:
Chelated iron 0.1 g
Distilled water 100.0 ml
Solution 4:
Na_2MoO_4 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.2 g
$CoCl_2 \times 6\ H_2O$ 0.0 2 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g

$CuSO_4 \times 5\ H_2O$ 0.02 g
Distilled water 1000.0 ml
Solution 5:
$NaNO_3$ 41.4 g
Distilled water 100.0 ml
Solution 6:
K_2HPO_4 1.74 g
Distilled water 100.0 ml
Autoclave solutions separately at 121°C for 15 min and mix aseptically.

36. *PROPIONIBACTERIUM* MEDIUM
Yeast extract 10.0 g
KH_2PO_4 1.0 g
$Na_2HPO_4 \times 2\ H_2O$ 3.0 g
Na-lactate (70%) 40.0 ml
Distilled water 1000.0 ml
Dissolve all ingredients and add Na-lactate.
pH 7.0
Autoclave at 121°C for 15 min.

37. KNOP MEDIUM WITH FILTER PAPER
$Ca(NO_3)_2$ 1.0 g
KH_2PO_4 0.25 g
$MgSO_4$ 0.25 g
$FeCl_3$ Traces
Agar 20.0 g
Distilled water 1000.0 ml
pH 6.5-7.0
Autoclave at 121°C for 15 min.
Sterilize filter paper strips by dry heat and soak with sterile medium.

38. MALT AGAR 7 BALLING WITH 12% NaCl (MA12NaCl)
Malt extract Balling 7 degrees 1000.0 ml
NaCl 120.0 g
Agar 20.0 g
Autoclave at 121°C for 15 min.

39. MALT 7 BALLING AGAR WITH 1% NaCl
Malt extract Balling 7 degrees 1000.0 ml
NaCl 10.0 g
Agar 20.0 g
Autoclave at 121°C for 15 min.

40. *AZOTOBACTER* MEDIUM 2
KH_2PO_4 0.2 g
K_2HPO_4 0.8 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$CaSO_4 \times 2\ H_2O$ 0.1 g
$FeCl_3$ Traces
Na_2MoO_4 Traces
Yeast extract 0.5 g
Sucrose 20.0 g
Agar 15.0-20.0 g
Distilled water 1000.0 ml

pH 7.2
Autoclave at 111°C for 30 min.

41. *FLAVOBACTERIUM* MEDIUM
Na-caseinate 2.0 g
Yeast extract 0.5 g
Peptone 1.0 g
K_2HPO_4 0.5 g
Agar 12.0 g
Distilled water 1000.0 ml
pH 7.4
Autoclave at 121°C for 15 min.

42. *PSEUDOMONAS SACCHAROPHILA* MEDIUM
Solution 1:
KH_2PO_4 4.4 g
Na_2HPO_4 4.8 g
NH_4Cl 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
Agar (if needed) 20.0 g
Distilled water 985.0 ml
Solution 2:
Ferric ammonium citrate 50.0 mg
$CaCl_2$ 5.0 mg
Distilled water 5.0 ml
Solution 3:
Sucrose 1.0 g
Distilled water 10.0 ml
Autoclave solutions 1 and 2 separately at 121°C for 15 min, solution 3 at 111°C for 30 min and mix aseptically.

43. SEA WATER MEDIUM WITH YEAST EXTRACT
Sea salt 37.9 g
Yeast extract 3.0 g
Peptone 10.0 g
Agar 20.0 g
Distilled water to 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

44. *HALOBACTERIUM* MEDIUM 1
Solution 1:
NaCl 250.0 g
$MgSO_4 \times 7\ H_2O$ 10.0 g
KCl 5.0 g
$CaCl_2 \times 6\ H_2O$ 0.2 g
Tap water 800.0 ml
Solution 2:
Yeast extract 10.0 g
Tryptone 2.5 g
Agar 20.0 g
Tap water 200.0 ml
Autoclave solutions separately at 121°C for 15 min and mix aseptically.

45. STARVED AGAR
Agar 20.0 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.

46. SP MEDIUM FOR *STIGMATELLA AURANTIACA*
Raffinose 1.0 g
Sucrose 1.0 g
Galactose 1.0 g
Starch (soluble) 5.0 g
Casitone 2.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
K_2HPO_4 0.25 g
Agar 15.0 g
Distilled water 1000.0 ml
Autoclave at 111°C for 30 min.

47. CM + YE MEDIUM
Casamino acids 7.5 g
Yeast extract 10.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
Na-citrate 3.0 g
KCl 2.0 g
NaCl 200.0 g
Agar 15.0 g
$FeSO_4 \times 7\ H_2O$ in 0.01N HCl (see below) 1.0 ml
Distilled water 1000.0 ml
Solution of $FeSO_4 \times 7\ H_2O$:
HCl (0.01 N) 100.0 ml
$FeSO_4 \times 7\ H_2O$ 4.98 g
pH 7.4 (adjust with 1N NaOH)
Autoclave solutions separately at 121°C for 15 min and mix aseptically.

48. CASEIN MEDIUM
NaCl 250.0 g
Casein hydrolysate 5.0 g
Yeast extract 5.0 g
$MgCl_2 \times 6\ H_2O$ 20.0 g
KCl 2.0 g
$CaCl_2 \times 2\ H_2O$ 0.2 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.4 (adjust with 1N NaOH)
Autoclave at 121°C for 15 min.

49. *HALOBACTERIUM* MEDIUM 2
Solution 1:
NaCl 120.0 g
$MgCl_2 \times 6\ H_2O$ 50.0 g
K_2SO_4 5.0 g
$CaCl_2 \times 6\ H_2O$ 0.2 g
Distilled water 500.0 ml
Solution 2:
Tryptone 5.0 g

Yeast extract 5.0 g
Agar 20.0 g
Distilled water 500.0 ml
pH 6.8
Autoclave solutions separately at 121°C for 15 min and mix aseptically.

50. YEAST GLUCOSE AGAR
Yeast extract 5.0 g
Peptone 5.0 g
Glucose 10.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

51. CASITONE AGAR
Casitone 3.0 g
$CaCl_2 \times 2\ H_2O$ 1.36 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C for 15 min.

52. CASITONE YEAST MEDIUM
Casitone 3.0 g
$CaCl_2 \times 2\ H_2O$ 1.36 g
Yeast extract 1.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C for 15 min.

53. *THERMUS THERMOPHILUS* MEDIUM
Yeast extract 4.0 g
Polypeptone 8.0 g
NaCl 2.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

54. *DESULFOVIBRIO* MEDIUM WITH 1% NaCl
K_2HPO_4 0.01 g
NaCl 10.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Na-lactate (40%) 4.0 ml
Solution of *More* salt (see below) 1.0 ml
Yeast extract 1.0 g
Ascorbic acid 0.1 g
Agar 6.0 g
Distilled water 1000.0 ml
Solution of More salt:
$Fe(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 1.0 g
Distilled water 5.0 ml

Autoclave solutions separately at 121°C for 15 min and mix aseptically.

55. *CAULOBACTER* MEDIUM
Peptone 2.0 g
Yeast extract 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Agar 10.0 g
Tap water 1000.0 ml
Autoclave at 121°C for 15 min.

56. *CAULOBACTER* MEDIUM WITH GLUCOSE
Peptone 2.0 g
Yeast extract 1.0 g
Glucose 2.0 g
Riboflavin 1.0 mg
$MgSO_4 \times 7\ H_2O$ 0.2 g
Agar 10.0 g
Tap water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

57. PEPTONE MEAT AGAR WITH 1% UREA
Peptone 10.0 g
Beef extract 3.0 g
NaCl 5.0 g
Urea 10.0 g
Agar 20.0 g
Distilled water 1000.0 ml
Do not adjust pH; pH raises to about 8 due to heat degraded urea.
Autoclave at 121°C for 15 min.

58. *HALOBACTERIUM* MEDIUM 3
Solution 1:
Casamino acids 7.5 g
Yeast extract 10.0 g
Na-citrate 3.0 g
KCl 2.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
$FeCl_3$ traces
NaCl 250.0 g
Distilled water 750.0 ml
Solution 2:
Agar 25.0 g
Distilled water 250.0 ml
pH 7.4
Autoclave solutions separately at 121°C for 15 min. and mix aseptically.

59. *PSEUDONOCARDIA THERMOPHILA* MEDIUM
Peptone 2.5 g
Meat extract 2.5 g
NaCl 2.5 g
Yeast extract 0.1 g
Glucose 2.5 g
Sucrose 5.0 g

Casein acidic hydrolysate 0.1 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

60. ALFALFA AGAR
K_2HPO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
KH_2PO_4 0.5 g
NaCl 0.2 g
$CaSO_4$ 0.1 g
$(NH_4)_2MoO_4$ Traces
Mannitol 20.0 g
Alfalfa meal 10.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0-7.2.
Autoclave at 111°C for 20 min.

61. MEDIUM FOR NITROGEN-FIXING *SPIRILLUM*
K_2HPO_4 0.1 g
KH_2PO_4 0.4 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
NaCl 0.1 g
$CaCl_2$ 0.02 g
$FeCl_3$ 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.0 2 g
Na-malate 5.0 g
Yeast extract 50.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

62. MANURE TINCTURE
Cow manure (fresh) 1.0 kg
Distilled water 3000.0 ml
Boil, squeeze through gauze into a bottle and dilute to 3000.0 ml.

63. MEDIUM WITH CURD DECOCTION
Curd decoction 61.0 ml
Manure tincture 184.0 ml
Na-acetate 1.0 g
Agar 20.0 g
Tap water 735.0 ml
pH 7.8
Preparation of curd decoction: pour 9000.0 ml of distilled water into 3.0 kg of curd and add 150.0 of dry *Aspergillus terricola* mycelium, shake, pour chloroform, seal with a stopper. Decoct at 37°C for 10 days, adjust pH to 7.0 with 1 N NaOH. The decoction shall contain 400 mg% amine nitrogen and 300 mg% tryptophan.
Preparation of manure tincture: mix cow manure (fresh) 1.0 kg and distilled water 3000.0 ml. Boil, squeeze through gauze into a bottle and dilute to 3000.0 ml.
Autoclave at 121°C for 15 min.

64. PEPTONE YEAST AGAR
Peptone 5.0 g
Yeast extract 3.0 g
KH_2PO_4 0.2 g
Glucose 5.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.0-7.2
Autoclave at 111°C for 30 min.

65. OATMEAL AGAR FOR BACTERIA
Oatmeal 2.0 g
Peptone 0.5 g
NaCl 1.0 g
Galactose 0.5 g
Agar 12.0 g
Distilled water 1000.0 ml
pH 7.5
Autoclave at 111°C for 30 min.

66. MEDIUM WITH SOIL EXTRACT
Peptone 5.0 g
Beef extract 3.0 g
Agar 15.0 g
Soil extract 250.0 ml
Tap water 750.0 ml
pH 7.0
Autoclave at 121°C for 15 min.
Preparation of soil extract: dry garden soil, rich in organic material, in the air by spreading in a thin layer, comminuting and stirring. Then sieve through a rough sieve, and mix 400 g of soil with 960 ml of tap water. Autoclave at 121°C for 1 hour at the end of the day but leave the autoclave open overnight. Filter the cooled extract through filter paper, autoclave 300 ml of filtrate at 121°C for 20 min and allow to stay for 2 weeks or longer to settle the sediment. Decant the clear supernatant liquid and use to prepare the medium.

67. PEPTONE MEAT AGAR WITH TRACE ELEMENTS
Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
Yeast autolysate 2.0 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Agar 20.0 g
Trace element solution:
H_3BO_3 5.0 g
$(NH_4)_2MoO_4$ 5.0 g
KI 0.5 g
NaBr 0.5 g
$ZnSO_4$ 0.2 g
$Al_2(SO_4)_3$ 0.3 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

68. PEPTONE MEAT AGAR WITH 3% SEA SALT
Peptone 10.0 g
NaCl 5.0 g
Sea salt 30.0 g
Beef extract 3.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

69. DAVIS SUPPLEMENTED MINIMAL MEDIUM
Solution 1:
Yeast extract 2.0 g
Casein hydrolysate 2.0 g
K_2HPO_4 7.0 g
KH_2PO_4 3.0 g
Na-citrate × 3 H_2O 0.5 g
$MgSO_4$ × 7 H_2O 0.1 g
$(NH_4)_2SO_4$ 1.0 g
Agar 15.0 g
Distilled water 980.0 ml
Solution 2:
Glucose 2.0 g
Distilled water 20.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

70. MEDIUM VY/2 FOR *STIGMATELLA AURANTIACA*
Baker's yeast 5.0 g
$CaCl_2$ × 2 H_2O 1.36 g
Vitamin B_{12} 0.5 mg
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2 (adjust with KOH before adding agar)
Autoclave at 111°C for 30 min. Vitamin B_{12} sterilize separately with filtration.

71. *NITROSOCOCCUS* MEDIUM 1
$(NH_4)_2SO_4$ 1.32 g
$MgSO_4$ × 7 H_2O 380.0 mg
$CaCl_2$ × 2 H_2O 20.0 mg
Chelated iron (13% iron) 1.0 mg
Na_2MoO_4 × 2 H_2O 100.0 mkg лучше µg
$MnCl_2$ × 4 H_2O 200.0 µg
$CoCl_2$ × 6 H_2O 2.0 µg
$ZnSO_4$ × 7 H_2O 100.0 µg
K_2HPO_4 8.7 mg
Phenol red (0.04%) 3.25 ml
Sea water 1000.0 ml
pH 7.5-7.8 (adjust with 1 N HCl)
Autoclave at 121°C for 15 min.

72. BEAN AGAR
Beans (peas or pulse) 100.0 g
K_2HPO_4 0.5 g

Sucrose 10.0 g
Agar 20.0 g
Tap water 1000.0 ml
Boil beans in 1000.0 ml of water, filter through gauze, add water to the initial volume; add phosphate, sucrose and agar
pH 7.2-7.4
Autoclave at 111°C for 30 min.

73. GYT-AGAR
Glucose 10.0 g
Yeast extract 1.0 g
Tryptose 2.0 g
$FeSO_4 \times 7\ H_2O$ 1.0 mg
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

74. HOTTINGER BROTH
Hottinger broth (HiMedia M1425) 23.0 g
Autoclave at 121°C for 15 min.

75. MODIFICATION OF TWEEN-80 MEDIUM FOR MILK-ACID BACTERIA
Yeast extract 5.0 g
Glucose 2.5 g
Beef extract 1.2 g
Tween-80 1.0 ml
K_2HPO_4 2.0 g
Na-acetate 5.0 g
NH_4-citrate 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$MnSO_4 \times 4\ H_2O$ 0.05 g
Agar 5.0 g
Distilled water 1000.0 ml
pH 6.0-6.5
Autoclave at 111°C for 30 min.

76. GLUCOSE MINERAL MEDIUM
KNO_3 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.04 g
$CaCl_2 \times 2\ H_2O$ 0.0 4 g
Na_2HPO_4 0.3 g
KH_2PO_4 0.14 g
Glucose 5.0 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g

$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Final pH 7.0 (with KOH).
Autoclave base medium and trace element solution at 121°C for 15 min.

77. PEPTONE MEAT AGAR WITH VITAMINS
Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
Yeast extract 1.0 g
Glucose 1.0 g
Vitamin B_{12} 2.0 mg
Thiamin 2.0 mg
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

78. PEPTONE MEAT AGAR WITH 2% SOLUBLE STARCH
Peptone 10.0 g
Beef extract 3.0 g
NaCl 5.0 g
Soluble starch 20.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

79. PEPTONE MEAT AGAR WITH 1% SOLUBLE STARCH
Peptone 10.0 g
Beef extract 3.0 g
NaCl 5.0 g
Soluble starch 10.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C for 15 min.

80. PEPTONE MEAT AGAR WITH 6% NaCl
Peptone 10.0 g
Beef extract 3.0 g
NaCl 60.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

81. PEPTONE MEAT AGAR WITH 1.8% SEA SALT
Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
Sea salt 18.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

82. POTATO AGAR WITH 2% GLUCOSE
Potato 200.0 g
Glucose 20.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.0
Boil 200 g scrubbed and sliced potatoes in 1000.0 ml water for 1 hour, filter cold through a cotton-gauze filter, add water to the initial volume, add glucose and agar. Do not use new potatoes.
Autoclave at 111°C for 30 min.

83. LOPATINA MEDIUM
Glucose 10.0 g
KH_2PO_4 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Tyrosine 1.0 g
NaCl 0.2 g
$CaSO_4$ 0.1 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min

84. MEDIUM WITH CASEIN HYDROLYSATE
Casein hydrolysate 10.0 g
Glucose 5.0 g
p-Aminobenzoic acid 5.0 mg
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

85. MEDIUM WITH HOTTINGER BROTH
Peptone 10.0 g
Yeast autolysate 10.0 g
Hottinger broth (HiMedia M1425) 0.23 g
Phosphate solution (see below) 25.0 ml
Salt solution (see below) 25.0 ml
Glucose 5.0 g
Distilled water 950.0 ml
Phosphate solution:
KH_2PO_4 100.0 mg
K_2HPO_4 100.0 mg
Distilled water 25.0 ml

Salt solution:
$MgSO_4 \times 7\ H_2O$ 40.0 mg
NaCl 2.0 mg
$FeSO_4$ 2.0 mg
Distilled water 25.0 ml
pH 7.0
Autoclave phosphate and salt solutions at 121°C for 15 min, base medium at 111°C for 30 min.

86. *NITROSOLOBUS* MEDIUM 1
$CaCl_2 \times 2\ H_2O$ 0.02 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Chelated iron 1.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.2 mg
$CoCl_2 \times 6\ H_2O$ 2.0 mg
$CuSO_4 \times 5\ H_2O$ 0.02 mg
$ZnSO_4 \times 7\ H_2O$ 0.1 mg
$(NH_4)_2SO_4$ 1.65 g
K_2HPO_4 0.087 g
Phenol red 5.0 mg
Distilled water 1000.0 ml
pH 7.5 (adjust with 0.1 M $NaHCO_3$)
Autoclave at 121°C for 15 min.

87. *NITROSOCOCCUS* MEDIUM 2
NH_4Cl 0.5 g
KH_2PO_4 0.05 g
$CaCO_3$ 5.0 g
Chelated iron 1.0 mg
Phenol red (0.04%) 3.25 ml
Sea water 1000.0 ml
pH 7.5-7.8 (adjust with 1 N HCl)
Autoclave at 121°C for 15 min.

88. *SPIRILLUM* MEDIUM
Peptone 10.0 g
Succinic acid 1.0 g
$(NH_4)_2SO_4$ 1.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$FeCl_3 \times 6\ H_2O$ 2.0 mg
$MnSO_4 \times H_2O$ 2.0 mg
Distilled water 1000.0 ml
pH 6.8
Autoclave at 121°C for 15 min.

89. MILK MEDIUM FOR HALOPHILS
Solution 1:
Milk 500.0 ml
Solution 2:
$MgSO_4 \times 7\ H_2O$ 10.0 g
KNO_3 2.0 g
NaCl 200.0 g
Distilled water 100.0 ml
Solution 3:

Peptone 5.0 g
Glycerol 10.0 g
Agar 25.0 g
Distilled water 400.0 ml
pH 8.4
Autoclave at 121°C for 15 min.
Sequence of mixing: add warm skim milk to a hot mixture of solutions 1 and 2.

90. *DESULFOVIBRIO GIGAS* MEDIUM
Solution 1:
KH_2PO_4 1.0 g
NH_4Cl 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.4 g
Na_2SO_4 2.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
Trace element solution *SL-6*: (see below) 1.0 ml
2 M H_2SO_4 1.0 ml
Na L-lactate 2.0 g
Distilled water 950.0 ml
Solution 2:
$NaHCO_3$ 2.0 g
Distilled water 40.0 ml
Solution 3:
$Na_2S \times 9\ H_2O$ 300.0 mg
Distilled water 6.0 ml
Vitamin solution:
Biotin 2.5 mg
Nicotinic acid 25.0 mg
Thiamine-HCl 12.5 mg
p-Aminobenzoic acid 12.5 mg
Calcium pantothenate 6.5 mg
Pyridoxine-HCl 62.5 mg
Distilled water 1000.0 ml
Trace element solution SL-6:
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
pH 7.2
Autoclave solutions 1 and 3 separately under N_2 at 121°C for 15 min, add 5.0 ml of the filter sterilized vitamin solution to 1000.0 ml of sterile solution 1. Solution 2 (autoclave at 121°C for 15 min) is not to be kept for long.

91. *THERMODESULFOBACTERIUM* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
NH_4Cl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
KH_2PO_4 0.3 g
$Na_2HPO_4 \times 12\ H_2O$ 2.0 g

$FeSO_4 \times 7\ H_2O$ 1.5 mg
Resazurin 1.0 mg
Distilled water 930.0 ml
Solution 2:
Trace element solution (see below) 10.0 ml
Solution 3:
Yeast extract 1.0 g
Distilled water 25.0 ml
Solution 4:
Na-lactate 4.0 g
Distilled water 25.0 ml
Solution 5:
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 6.0 ml
Solution 6:
Vitamin solution (see below) 5.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 g
$FeCl_2 \times 4\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$CoCl_2 \times 6\ H_2O$ 0.17 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.026 g
NaCl 1.0 g
$Na_2SeO_3 \times 5\ H_2O$ 0.02 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 6.8-7.0
Solutions 1, 3, 4 and 5 autoclave under N_2 at 121°C for 15 min.
Solution 6 is filter sterilized. Before use, neutralize solution 5 by dropwise of 1 N HCl.

92. *DESULFOVIBRIO* MEDIUM WITH LACTATE
Solution 1:
K_2HPO_4 0.5 g
NH_4Cl 1.0 g
$CaCl_2 \times 6\ H_2O$ 0.1 g
$MgSO_4 \times 7\ H_2O$ 2.0 g
Na_2SO_4 1.0 g
Na-lactate 5.0 g
Yeast extract 1.0 g

Resazurin 0.01 g
Cysteine 0.5 g
Distilled water 950.0 ml
Solution 2:
$NaHCO_3$ 4.0 g
Distilled water 40.0 ml
Solution 3:
$Na_2S \times 9\ H_2O$ 300.0 mg
Distilled water 6.0 ml
Solution 4:
$FeSO_4 \times 7\ H_2O$ 0.4 g
Distilled water 10.0 ml
pH 6.8
Autoclave all solutions separately at 121°C for 15 min. Solution 1 bring to boil while simultaneously bubbling a mixture of oxygen-free gas composed of 97% N_2 and 3% H_2 through the mixture and sterilize in atmosphere of this gas mixture. Solution 3 sterilize in atmosphere of N_2.

93. *AZOSPIRILLUM BRASILIENSE* MEDIUM 1
Ca-malate 10.0 g
K_2HPO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
Distilled water 1000.0 ml
pH 6.5
Autoclave at 121°C for 15 min.

94. MEDIUM FOR CARBON MONOOXIDE OXIDIZERS
$Na_2HPO_4 \times 12\ H_2O$ 4.5 g
KH_2PO_4 0.75 g
NH_4Cl 1.5 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.03 g
Fe(NH_4)-citrate 0.018 g
Agar (if necessary) 1.2 g
Trace element solution *SL-6* (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
Distilled water 1000.0 ml
Trace element solution SL-6:
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg

Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min, add vitamin solution sterilized by filtration. For chemoautotrophic growth incubate under gas atmosphere of a) 20-80% CO_2 + 10% O_2 + 0-70% N_2 or b) 70% H_2 + 20% O_2 + 10% CO_2 adding 2.5 g $NaHCO_3$ per liter of medium. For chemoorganotrophic growth add 3.0 g sodium acetate and incubate under air.

95. *DESULFOTOMACULUM ACETOXIDANS* MEDIUM
Solution 1:
NaCl 1.17 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.3 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
NH_4Cl 0.27 g
KH_2PO_4 0.2 g
Na_2SO_4 2.84 g
Na-acetate 1.4 g
Na-butyrate 1.4 g
Yeast extract 1.0 g
Vitamin solution (see below) 1.0 ml
Trace element solution 1.0 ml (see below)
Distilled water 940.0 ml
Solution 2:
$Na_2S \times 9\ H_2O$ 0.36 g
Distilled water 10.0 ml
Sodium bicarbonate for alkalization:
$NaHCO_3$ 4.5 g
Distilled water 50.0 g
Vitamin solution:
p-Aminobenzoic acid 4.0 mg
D(+)-Biotin 1.0 mg
Thiamine-HCl 10.0 mg
Distilled water 100.0 ml
Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 68.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 ml
H_3BO_3 62.0 mg
$CoCl_2 \times 6\ H_2O$ 120.0 ml
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
HCl (0.05 M) 1000.0 ml
pH 7.0-7.2
Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9 - 7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution is filter sterilized.

96. *DESULFONEMA LIMICOLA* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
NaCl 13.0 g

$MgCl_2 \times 6\ H_2O$ 2.2 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
KCl 0.5 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
Distilled water 850.0 ml
Solution 2:
Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 5.0 g
Distilled water 100.0 ml
Solution 4:
Na-acetate $\times 3\ H_2O$ 2.5 g
Distilled water 10.0 ml
Solution 5:
Disodium succinate 0.1 g
Distilled water 1.0 ml
Solution 6:
Vitamin solution (see below) 5.0 ml
Solution 7:
$AlCl_3 \times 6\ H_2O$ 245.0 mg
Distilled water 5.0 ml
Solution 8:
Na_2CO_3 170.0 mg
Distilled water 1.6 ml
Solution 9:
Rumen fluid, clarified 20.0 ml
Solution 10:
$Na_2S \times 9\ H_2O$ 0.4 mg
Distilled water 10.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.6

The trace element solution preparation: $FeCl_2 \times 4\ H_2O$ is dissolved firstly in HCl, and then is mixed with water and other salts are dissolved in the sequence indicated. Solution 1 is boiled for a few minutes, cooled to room temperature, gassed with 80% N_2 + 20% CO_2 gas mixture to reach a pH of around 6, then autoclaved anaerobically under the same gas. Solutions 2, 3, 5, 9, and 10 are autoclaved separately under nitrogen at 121°C for 15 min, solution 3 is filter-sterilized and flushed with 80% N_2 + 20% CO_2 to remove dissolved oxygen. Solution 6 is filter-sterilized and outgassed with N_2. Solutions 7 and 8 are combined before autoclaving at 121°C for 15 min. Solutions 2 to 10 are added to the sterile cooled solution A in the sequence as indicated. The completed medium is distributed anaerobically under 80% N_2 + 20% CO_2 into appropriate vessels.

97. *DESULFONEMA MAGNUM* MEDIUM

Solution 1:
Na_2SO_4 3.0 g
NaCl 21.0 g
$MgCl_2 \times 6\ H_2O$ 5.5 g
$CaCl_2 \times 2\ H_2O$ 1.35 g
KCl 0.5 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
Distilled water 850.0 ml
Solution 2:
Trace element solution (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 2.5 g
Distilled water 100.0 ml
Solution 4:
Na-benzoate 0.6 g
Distilled water 10.0 ml
Solution 5:
Disodium succinate 0.1 g
Distilled water 1.0 ml
Solution 6:
Vitamin solution (see below) 5.0 ml
Solution 7:
$AlCl_3 \times 6\ H_2O$ 245.0 mg
Distilled water 5.0 ml
Solution 8:
Na_2CO_3 170.0 mg
Distilled water 1.6 ml
Solution 9:
Rumen fluid, clarified 20.0 ml
Solution 10:
$Na_2S \times 9\ H_2O$ 0.4 mg
Distilled water 10.0 ml
Trace element solution:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg

Na_2SeO_4 3.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Vitamin B_{12} 50.0 mg
Distilled water 1000.0 ml
pH 7.6
The trace element solution preparation: $FeCl_2 \times 4\ H_2O$ is dissolved firstly in HCl, and then is mixed with water and other salts are dissolved in the sequence indicated. Solution 1 is boiled for a few minutes, cooled to room temperature, gassed with 80% N_2 + 20% CO_2 gas mixture to reach a pH of around 6, then autoclaved anaerobically under the same gas. Solutions 2, 3, 5, 9, and 10 are autoclaved separately under nitrogen at 121°C for 15 min, solution 3 is filter-sterilized and flushed with 80% N_2 + 20% CO_2 to remove dissolved oxygen. Solution 6 is filter-sterilized and outgassed with N_2. Solutions 7 and 8 are combined before autoclaving at 121°C for 15 min. Solutions 2 to 10 are added to the sterile cooled solution A in the sequence as indicated. The completed medium is distributed anaerobically under 80% N_2 + 20% CO_2 into appropriate vessels.

98. WORT AGAR 7 B WITH 2% $CaCO_3$
Malt extract Balling 7 degrees 1000.0 ml
$CaCO_3$ 20 g
Agar 20.0 g
Autoclave at 111°C for 30 min.

99. MEDIUM YE
Yeast extract 30.0 g
Ethanol 20.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
pH 5.0-6.0
Autoclave at 121°C for 15 min without ethanol.
Apply filter sterilize ethanol (0.1 ml/test tube) onto the surface of agar slants.

100. SAP-2 AGAR
Tryptone 1.0 g
Yeast extract 1.0 g
Agar 20.0 g
Sea water 1000.0 g
pH 7.4
Autoclave at 121°C for 15 min.

101. SOIL AGAR
Yeast extract 2.0 g
Tryptone 1.0 g
Na-acetate 1.0 g
Soil extract 50.0 ml
Agar 20.0 g

Distilled water add to 1000.0 ml
pH 7.4
Autoclave at 121°C for 15 min.
Preparation of soil extract: dry garden soil, rich in organic material, in the air by spreading in a thin layer, comminuting and stirring. Then sieve through a rough sieve, and mix 400 g of soil with 960 ml of tap water. Autoclave at 121°C for 1 hour at the end of the day but leave the autoclave open overnight. Filter the cooled extract through filter paper, autoclave 300 ml of filtrate at 121°C for 20 min and allow to stay for 2 weeks or longer to settle the sediment. Decant the clear supernatant liquid and use to prepare the medium.

102. *DESULFOBACTER POSTGATEI* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 7.0 g
$MgCl_2 \times 6\ H_2O$ 1.3 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 870.0 ml
Solution 2:
Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 5.0 g
Distilled water 100.0 ml
Solution 4:
Na-acetate $\times 3\ H_2O$ 2.5 g
Distilled water 10.0 ml
Solution 5:
Vitamin solution (see below) 10.0 ml
Solution 6:
$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg

Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.1-7.4
Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9-7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution is filter sterilized.

103. *DESULFOBULBUS* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 870.0 ml
Solution 2:
Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 5.0 g
Distilled water 100.0 ml
Solution 4:
Na-propionate 1.5 g
Distilled water 10.0 ml
Solution 5:
Vitamin solution (see below) 10.0 ml
Solution 6:
$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml

pH 7.1-7.4
Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9-7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution is filter sterilized.

104. *MACROMONAS* MEDIUM 1
Na-acetate 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
Casein acidic hydrolysate 0.1 g
Yeast extract 0.1 g
FeS or CaS 0.2 g
Agar 1.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Prepare suspension of FeS separately from the equimolar solutions of $Na_2S \times 9\ H_2O$ and $FeSO_4$, wash with freshly boiled distilled water under the flow of inert gas, sterilize separately from the main medium under inert gas at 111°C for 30 min. Main medium autoclave at 121°C for 15 min.

105. *MACROMONAS* MEDIUM 2
$(NH_4)_2SO_4$ 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Casein acidic hydrolysate 1.0 g
Na-acetate $\times 3\ H_2O$ 1.0 g
or succinate, or benzoate 0.5 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.5 g
Catalase 2.0 mg
Vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
Vitamin solution:
Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
p-Aminobenzoic acid 50.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.
Sterilize catalase and vitamins separately from the main medium by filtration. Thiosulfate should also better be autoclaved separately at 121°C for 15 min.

106. *BEGGIATOA* MEDIUM 1
$(NH_4)_2SO_4$ 500.0 mg
$MgSO_4 \times 7\ H_2O$ 100.0 mg
$CaCl_2 \times 2\ H_2O$ 50.0 mg
Na-lactate 500.0 mg
$Na_2S_2O_3 \times 5\ H_2O$ 500.0 mg
K_2HPO_4 110.0 mg
KH_2PO_4 85.0 mg
$FeCl_3 \times 6\ H_2O$ 2.0 mg

EDTA 3.0 mg
Vitamin solution (see below) 1.0 ml
Buffer HEPES 0.01 M
Distilled water 1000.0 ml
Vitamin solution:
Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
p-Aminobenzoic acid 50.0 mg
Distilled water 1000.0 ml
pH 7.2-7.5 (adjust with NaOH)
Sterilize vitamins (by filtration); main medium, thiosulfate and lactate each separately (autoclave at 121°C for 15 min) and add into the main medium prior to inoculation.

107. *DESULFOSARCINA* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 13.5 g
$MgCl_2 \times 6\ H_2O$ 2.0 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 870.0 ml
Solution 2:
Trace element solution (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 5.0 g
Distilled water 100.0 ml
Solution 4:
Na-benzoate 0.6 g
Na-lactate 1.0 g
Distilled water 10.0 ml
Solution 5:
Vitamin solution (see below) 10.0 ml
Solution 6:
$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml
Trace element solution:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
$Na_2SeO_3 \times 5\ H_2O$ 3.0 mg

Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.1-7.4
Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9-7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution is filter sterilized.

108. *BEGGIATOA* MEDIUM 2
$MgCl_2 \times 6\ H_2O$ 50.0 mg
$CaCl_2 \times 2\ H_2O$ 30.0 mg
Na-lactate 500.0 mg
$Na_2S_2O_3 \times 5\ H_2O$ 500.0 mg
NaH_2PO_4 125.0 mg
KCl 125.0 mg
$NaHCO_3$ 125.0 mg
Na_2SO_4 500.0 mg
$NaNO_3$ 620.0 mg
Vitamin solution (see below) 1.0 ml
Trace element solution according to *Hogland*: (see below) 1.0 ml
Distilled water 1000.0 ml
Vitamin solution:
Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
p-Aminobenzoic acid 50.0 mg
Distilled water 1000.0 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml

pH 7.5 (adjust with 1% HCl)
To prepare the trace element solution, preliminarily acidify water to pH 3.0-4.0 with HCl. Sterilize thiosulfate, lactate, bicarbonate, trace elements and vitamins separately and add to the main medium prior to inoculation. Lactate and thiosulfate can be more conveniently prepared as 10% solutions; bicarbonate, as 5% solution. Sterilize the vitamin solution by filtration, others solutions and base medium by autoclaving at 121°C for 15 min.

109. *DESULFOVIBRIO* MEDIUM
Solution 1:
K_2HPO_4 0.5 g
NH_4Cl 1.0 g
Na_2SO_4 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$MgSO_4 \times 7\ H_2O$ 2.0 g
Na DL-lactate 2.0 g
Yeast extract 1.0 g
Resazurin 1.0 g
Distilled water 980.0 ml
Solution 2:
$FeSO_4 \times 7\ H_2O$ 0.5 g
Distilled water 10.0 ml
Solution 3:
Na-thioglycollate 0.1 g
Ascorbic acid 0.1 g
Distilled water 10.0 ml
Solution 4:
Trace element solution (see below) 1.0 ml
Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 68.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 ml
H_3BO_3 62.0 mg
$CoCl_2 \times 6\ H_2O$ 120.0 ml
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
HCl, 0.05 M 1000.0 ml
pH 7.4-7.8
Autoclave at 121°C for 15 min under an atmosphere of N_2. Solution 1 is boiled before sterilization, being blown with N_2.

110. *DESULFOVIBRIO* MEDIUM WITH 2% NaCl
Solution 1:
K_2HPO_4 0.5 g
NH_4Cl 1.0 g
NaCl 20 g
Na_2SO_4 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$MgSO_4 \times 7\ H_2O$ 2.0 g
Na DL-lactate 2.0 g
Yeast extract 1.0 g
Resazurin 1.0 mg
Distilled water 980.0 ml
Solution 2:
$FeSO_4 \times 7\ H_2O$ 0.5 g
Distilled water 10.0 ml

Solution 3:
Na-thioglycollate 0.1 g
Ascorbic acid 0.1 g
Distilled water 10.0 ml
Solution 4:
Trace element solution (see below) 1.0 ml
Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 68.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 62.0 mg
$CoCl_2 \times 6\ H_2O$ 120.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
HCl, 0.05 M 1000.0 ml
pH 7.4-7.8
Autoclave at 121°C for 15 min under an atmosphere of N_2. Solution 1 is boiled before sterilization, being blown with N_2.

111. *DESULFOVIBRIO* MEDIUM WITH 3% NaCl
Solution 1:
K_2HPO_4 0.5 g
NH_4Cl 1.0 g
NaCl 30 g
Na_2SO_4 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$MgSO_4 \times 7\ H_2O$ 2.0 g
Na DL-Lactate 2.0 g
Yeast extract 1.0 g
Resazurin 1.0 mg
Distilled water 980.0 ml
Solution 2:
$FeSO_4 \times 7\ H_2O$ 0.5 g
Distilled water 10.0 ml
Solution 3:
Na-thioglycollate 0.1 g
Ascorbic acid 0.1 g
Distilled water 10.0 ml
Solution 4:
Trace element solution (see below) 1.0 ml
Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 68.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 62.0 mg
$CoCl_2 \times 6\ H_2O$ 120.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
HCl, 0.05 M 1000.0 ml
pH 7.4-7.8
Autoclave at 121°C for 15 min under an atmosphere of N_2. Solution 1 is boiled before sterilization, being blown with N_2.

112. GLUCOSE YEAST EXTRACT AGAR
Glucose 20.0 g
Yeast extract 10.0 g

$CaCO_3$ 20.0 g
Agar 17.0 g
Distilled water 1000.0 ml
Autoclave at 111°C for 30 min.

113. *DESULFOVIBRIO BAARSII* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 870.0 ml
Solution 2:
Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 5.0 g
Distilled water 100.0 ml
Solution 4:
Na-butyrate 0.7 g
Na-caproate 0.3 g
Na-octanoate 0.15 g
Distilled water 10.0 ml
Solution 5:
Vitamin solution (see below) 10.0 ml
Solution 6:
$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 6.8-7.0

Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9-7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution is filter sterilized.

114. *AZOSPIRILLUM BRASILIENSE* MEDIUM 2

Ca-malate 10.0 g or
Glucose 20.0 g
K_2HPO_4 0.1 g
KH_2PO_4 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$FeCl_3 \times 6\ H_2O$ 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.02 mg
Yeast extract 0.1 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 6.9
Autoclave at 111°C for 30 min.

115. *METHANOBACTERIUM* MEDIUM

KH_2PO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.4 g
NaCl 0.4 g
NH_4Cl 0.4 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Trace element solution *SL-10* (see below) 1.0 ml
Vitamin solution (see below) 5.0 ml
Yeast extract 1.0 g
Na-acetate 1.0 g
Na-formate 2.0 g
$NaHCO_3$ 4.0 g
Resazurin 1.0 mg
L-Cysteine-HCl 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
Fatty acid mixture (see below) 20.0 ml
Sludge water: (see below) 50.0 ml
Distilled water 940.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg

Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Fatty acid mixture:
Valeric acid 0.5 g
Isovaleric acid 0.5 g
α-Methylbutyric acid 0.5 g
Isobutyric acid 0.5 g
Distilled water 20.0 ml
pH 7.5 (adjust with concentrated NaOH)
Sludge water: to sludge from an anaerobic digester add 0.4% yeast extract and after gassing with N_2 gas for a few minutes incubate it at 37°C for 24 hours. Then centrifuge the sludge at 13,000 g and autoclave the resulting clear supernatant under N_2 gas at 121°C for 15 min (pH 6.7-7.0). Base medium and trace element solution autoclave at 121°C for 15 min. Vitamin solution is filter sterilized. Prepare the medium anaerobically under a gas atmosphere of 80% H_2 and 20% CO_2.

116. *THERMUS RUBER* MEDIUM
Pepton 5.0 g
Yeast extract 1.0 g
Starch (soluble) 1.0 g
Agar 12.0 g
Distilled water 1000.0 ml
pH 8.0
Autoclave at 121°C for 15 min.

117. *METHANOSARCINA* MEDIUM
Solution 1:
NaCl 0.9 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
NH_4Cl 1.0 g
Yeast extract 2.0 g
Resazurin 10.0 mg
Methanol 10% 10.0 ml
Trace element solution (see below) 10.0 ml
Vitamin solution (see below) 5.0 ml
Distilled water 965.0 ml
Solution 2 (reducing agents):
L-Cysteine-HCl 0.5 g
$Na_2S \times 9\ H_2O$ 0. 5 g
Distilled water 10.0 ml
Buffer solutions:
a) K_2HPO_4 29.0 g
Distilled water 100.0 ml
b) KH_2PO_4 15.0 g
Distilled water 100.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 6\ H_2O$ 0.1 g

$CoCl_2 \times 2\ H_2O$ 0.17 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2 \times 2\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
NaCl 1.0 g
Na_2SeO_4 0.017 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4
Prepare medium in anaerobic conditions, blowing through with N_2 without O_2 up to sterilization. Solutions of reducing agents (10.0 ml) and of buffer (per 1 ml) add to base medium after separate sterilization. Base medium, trace elements, buffer solutions and reducing agents autoclave at 121°C for 15 min. Vitamin solution is filter sterilized.

118. PLATE COUNT AGAR
Tryptone 5.0 g
Yeast extract 2.5 g
Glucose 1.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.0±0.2
Autoclave at 121°C for 15 min.

119. *NITROSOLOBUS* MEDIUM 2
$(NH_4)_2SO_4$ 0.5 g
KH_2PO_4 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
$MgSO_4 \times 7\ H_2O$ 0.04 g
EDTA FeNa 3.8% 0.1 ml
Phenol red 0.05% 2.0 ml
Distilled water 1000.0 ml
pH 8.0 (adjust with 6% Na_2CO_3)
Autoclave at 121°C for 15 min.

120. MANNITOL AGAR WITH PEPTONE
Yeast extract 5.0 g
Mannitol 25.0 g
Peptone 3.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 5.0-6.0

Autoclave at 121°C for 15 min.

121. *THIOBACILLUS THIOOXIDANS* MEDIUM (WAKSMAN MEDIUM)
$(NH_4)_2SO_4$ 300.0 mg
$MgSO_4 \times 7\ H_2O$ 500.0 mg
KH_2PO_4 3.5 g
$CaCl_2 \times 2\ H_2O$ 250.0 mg
$FeSO_4 \times 7\ H_2O$ 18.0 mg
Finely dispersed sulfur 5.0 g
Distilled water 1000.0 ml
pH 4.5
Autoclave at 121°C for 15 min.

122. *THIOBACILLUS FERROOXIDANS* MEDIUM (LEATHEN MEDIUM)
$(NH_4)_2SO_4$ 150.0 mg
KCl 50.0 mg
$MgSO_4 \times 7\ H_2O$ 500.0 mg
KH_2PO_4 100.0 mg
$Ca(NO_3)_2 \times 4\ H_2O$ 10.0 mg
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.
After sterilization of the medium, add 10.0 ml of 10% $FeSO_4 \times 7\ H_2O$ preliminarily acidified to pH 3.5 and autoclaved separately in sealed ampoules under nitrogen. pH 4.0 (adjust after sterilization and addition of iron solution).

123. MEDIUM FOR MARINE *NITROBACTER*
Solution 1 (see below) 0.5 ml
Solution 2 (see below) 0.5 ml
Solution 3 (see below) 1.0 ml
Solution 4 (see below) 0.5 ml
Solution 5 (see below) 0.5 ml
Solution 6 (see below) 0.1 ml
Distilled water 300.0 ml
Sea water 700.0 ml
Solution 1:
$CaCl_2$ 2.0 g
Distilled water 100.0 ml
Solution 2:
$MgSO_4 \times 7\ H_2O$ 20.0 g
Distilled water 100.0 ml
Solution 3:
Chelated iron 0.1 g
Distilled water 100.0 ml
Solution 4:
Na_2MoO_4 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.2 g
$CoCl_2 \times 6\ H_2O$ 0.0 2 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$CuSO_4 \times 5\ H_2O$ 0.02 g
Distilled water 1000.0 ml
Solution 5:
$NaNO_3$ 41.4 g
Distilled water 100.0 ml
Solution 6:

K_2HPO_4 1.74 g
Distilled water 100.0 ml
pH 8.6 (adjust with NaOH or KOH)
Autoclave all solutions separately at 121°C for 15 min. Leave the medium to stand for 2–3 days so that pH can adjust itself to pH 7.4-7.6.

124. *AZOSPIRILLUM* MEDIUM
Solution 1:
Yeast extract 0.05 g
$FeSO_4 \times 7\ H_2O$ 0.01 g
K_2HPO_4 0.25 g
$Na_2MoO_4 \times 2\ H_2O$ 1.0 mg
$MnSO_4 \times H_2O$ 2.0 mg
$MgSO_4 \times 7\ H_2O$ 0.2 g
NaCl 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
$(NH_4)_2SO_4$ 1.0 g
Biotin 0.1 mg
Bromothymol blue 25.0 mg
Distilled water 950.0 ml
Solution 2:
Glucose 20% 25.0 ml
Solution 3:
Na-malate 20% 25.0 ml
Dissolve bromothymol blue in diluted KOH before adding into the medium.
pH 7.1
Autoclave solutions separately at 121°C for 15 min.

125. *NITROSOLOBUS* MEDIUM 3
$(NH_4)_2SO_4$ 2.0 g
$CaCl_2 \times 2\ H_2O$ 20.0 mg
$MgSO_4 \times 7\ H_2O$ 200.0 mg
Chelated iron 1.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 200.0 mg
$CoCl_2 \times 6\ H_2O$ 2.0 mg
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
K_2HPO_4 15.9 mg
$CuSO_4 \times 5\ H_2O$ 20.0 mg
Distilled water 1000.0 ml
pH 7.5-7.8
Autoclave at 121°C for 15 min.

126. *DESULFOCOCCUS NIACINI* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 13.5 g
$MgCl_2 \times 6\ H_2O$ 2.2 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 870.0 ml
Solution 2:

Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 5.0 g
Distilled water 100.0 ml
Solution 4:
Na-nicotinate 5.0 mM
Solution 5:
Vitamin solution (see below) 10.0 ml
Solution 6:
$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
$Na_2SeO_3 \times 5\ H_2O$ 40.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9-7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Trace element solution is autoclaved at 121°C for 15 min. Vitamin solution is filter sterilized.
Final pH of the complete medium 7.4

127. SELENITE CONTROL MEDIUM
Solution 1:
Peptone 5.0 g
Na_2HPO_4 7.0 g
NaH_2PO_4 3.0 g
Lactose 4.0 g
Distilled water 960.0 ml
pH 6.9-7.1
Solution 2:
10% $Na_2SeO_3 \times 5\ H_2O$ 40.0 ml
Autoclave at 111°C for 30 min.

128. HIRSCH MEDIUM
KH_2PO_4 1.36 g
Na_2HPO_4 2.15 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$MnSO_4 \times 5\ H_2O$ 1.05 g
$(NH_4)_2SO_4$ 0.5 g
$CaCl_2 \times 2\ H_2O$ 5.97 mg
$Na_2MoO_4 \times 2\ H_2O$ 1.5 mg
Methanol 5.0 ml
Distilled water to 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min. Sterilize methanol by filtration and add to the medium after autoclaving.

129. CONTROL MEDIUM C-1
KH_2PO_4 2.0 g
K_2HPO_4 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
NaCl 5.0 g
Raffinose 2.0 g
Bromothymol blue (1.6% alkaline) 2.0 ml
Crystal violet (0.01%) 20.0 ml
50% Urea 4.0 ml
Distilled water 975.0 ml
Autoclave at 111°C for 30 min. Urea solution is filter sterilized.

130. POTATO–GLUCOSE AGAR
Potato 200.0 g
Glucose 10.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.0
Boil 200g scrubbed and sliced potatoes in 1000.0 ml water for 1 hour, filter cold through a cotton-gauze filter, add water to the initial volume, add glucose and agar. Do not use new potatoes.
Autoclave at 111°C for 30 min.

131. MEDIUM Q MOD FOR *FRANKIA*
K_2HPO_4 300.0 mg
NaH_2PO_4 200.0 mg
$MgSO_4 \times 7\ H_2O$ 200.0 mg
KCl 200.0 mg
Yeast extract 500.0 mg
Peptone 5.0 g
Glucose 10.0 g
Fe-citrate 1.0 ml
Trace element solution (see below) 1.0 ml
$CaCO_3$ 100.0 mg
Tween-80 2.0 g
Agar 15.0 g
Distilled water 1000.0 ml
Trace element solution:
H_3BO_3 1.5 g
$MnSO_4 \times 7\ H_2O$ 0.8 g
$ZnSO_4 \times 7\ H_2O$ 0.6 g

$CuSO_4 \times 5\ H_2O$ 0.1 g
$(NH_4)_6Mo_7O_{24} \times 4\ H_2O$ 0.2 g
$CoSO_4$ 0.0 1 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

132. *THIOBACILLUS FERROOXIDANS* MEDIUM 9K
Solution 1:
KCl 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
K_2HPO_4 0.5 g
$Ca(NO_3)_2 \times 4\ H_2O$ 0.01 g
Distilled water 700.0 ml
Solution 2:
$(NH_4)_2Fe(SO_4)_2$ 63.0 g
H_2SO_4 (10 N) 1.0 ml
Distilled water 300.0 ml
pH 3.5
Autoclave solution 1 at 121°C for 15 min, solution 2 at 111°C 30 min. Mix the solutions before inoculation.

133. COLBY AND ZATMAN MEDIUM WITH METHANOL
K_2HPO_4 1.2 g
KH_2PO_4 0.62 g
$CaCl_2 \times 6\ H_2O$ 0.05 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
NaCl 0.1 g
$FeCl_3 \times 6\ H_2O$ 1.0 mg
$(NH_4)_2SO_4$ 0.5 g
$CuSO_4 \times 5\ H_2O$ 5.0 µg
$MnSO_4 \times 5\ H_2O$ 10.0 µg
$Na_2MoO_4 \times 2\ H_2O$ 10.0µg
H_3BO_3 10.0 µg
$ZnSO_4 \times 7\ H_2O$ 70.0 µg
$CoCl_2 \times 6\ H_2O$ 5.0µg
Purified agar 15.0 g
Methanol 1.0 ml
Distilled water 1000.0 ml
pH 6.8
Autoclave at 121°C for 15 min. Methanol is filter sterilized.

134. METHYLOTROPH MEDIUM 1
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g
NaCl 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.0 2 g
Methanol 5.0 ml
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min. Methanol is filter sterilized. Methanol may be replacement 30 ml 10 % solution of methylamine, autoclave at 111°C for 30 min.

135. METHYLOTROPH MEDIUM 2
KH_2PO_4 0.8 g
$Na_2HPO_4 \times 12\ H_2O$ 3.0 g
$(NH_4)_2SO_4$ 0.8 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 10.0 mg
Methanol 5.0 ml
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
$CaCl_2 \times 2\ H_2O$ 1.25 g
$CoCl_2 \times 6\ H_2O$ 1.25 g
$MnSO_4 \times 4\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 1.25 g
$Na_2MoO_4 \times 2\ H_2O$ 50.0 mg
$CuCl_2 \times 2\ H_2O$ 250.0 mg
Distilled water 250.0 ml
pH 7.0-7.2
Autoclave at 121°C for 15 min. Methanol is filter sterilized. Methanol may be replacement 30 ml 10 % solution of methylamine, autoclave at 111°C for 30 min.

136. MEDIUM FOR PERCHLORATE-REDUCING BACTERIA
Solution 1:
NH_4Cl 0.1 g
NaCl 0.02 g
KH_2PO_4 0.1 g
K_2HPO_4 0.4 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
Tap water 1000.0 ml
Solution 2:
HCl, to dissolve the precipitate in solution 1
Solution 3:
pH 6.9-7.2 (adjust with 5% NaOH)
Solution 4:
5% NH_4ClO_4 5.0 ml
Solution 5:
5% Na-acetate 5.0 ml
Solution 6:
Trace element solution according to *Hogland* (see below) 0.5 ml
Solution 7:
Vitamin B_{12} (dispensary solution) 0.2 ml
Solution 8:
96° ethanol 0.5 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml

Sterilize ethanol by filtration, others solutions separately autoclave at 121°C for 15 min. Add solutions and additions to the main medium in the order of their enumeration.

137. MEDIUM FOR CHROMATE-REDUCING BACTERIA

Solution 1:
NH_4Cl 0.3 g
NaCl 0.1 g
KH_2PO_4 0.5 g
K_2HPO_4 0.3 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$CaCO_3$ 0.05 g
$FeCl_3 \times 6\ H_2O$ 0.05 g
K_2CrO_4 0.1 g
Paper-filtered pond water 900.0 ml
Solution 2:
Peptone meat broth 100.0 ml
Solution 3:
5% Na-acetate 5.0 ml
Solution 4:
Trace element solution according to *Hogland* (see below) 0.5 ml
Solution 5:
Vitamin B_{12} (dispensary solution) 0.2 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml
pH 7.0-7.2
Autoclave solutions separately at 121°C for 15 min. Add solutions and additions to the main medium in the order of their enumeration.

138. LARSEN PHOTOTROPH MEDIUM

NH_4Cl 0.5 g
KH_2PO_4 1.0 g
$MgCl_2$ 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
Trace element solution SL-12B (see below) 1.0 ml
$NaHCO_3$ 5.0 g
Na-acetate $\times 3\ H_2O$ 2.0 g
$Na_2S_2O_3$ 0.4-0.6 g
$Na_2S \times 9\ H_2O$ 0.1 g
Fe-citrate – traces
Distilled water 1000.0 ml
Trace element solution SL-12B:
EDTA Na 3.0 g
$FeSO_4 \times 7\ H_2O$ 1.1 g
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$MnCl_2 \times 2\ H_2O$ 50.0 mg

$ZnCl_2$ 42.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 18.0 mg
H_3BO_3 300.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Distilled water 1000.0 ml
pH of the trace element solution 6.0
pH 8.4
Autoclave solutions separately at 121°C for 15 min.

139. POSTGATE MEDIUM B FOR SULFATE REDUCERS
Solution 1:
NaCl 1.0 g
KH_2PO_4 0.5 g
NH_4Cl 1.0 g
$CaSO_4 \times 2\ H_2O$ 1.0 g
$MgSO_4 \times 7\ H_2O$ 2.0 g
Na-lactate 3.5 g
Yeast extract 1.0 g
Tap water 980.0 ml
Dissolve ingredients and sparge medium with O_2 free N_2 gas for 10-15 minutes
Solution 2:
Ascorbic acid 1.0 g
Thioglycolic acid 1.0 g
Distilled water 10.0 ml
Solution 3:
$FeSO_4 \times 7\ H_2O$ 0.5 g
Distilled water 10.0 ml
pH 7.4
Autoclave solution 1 at 121°C for 15 min, solutions 2 and 3 separately autoclave at 111°C for 30 min.

140. DILUTED BRAIN HEART INFUSION MEDIUM (DILUTED BHI MEDIUM)
BHI broth (Pronadisa 1400) 3.7 g or
Peptone mixture 1.0 g
Beef heart infusion 1.0 g
Calf brain infusion 0.75 g
Glucose 0.2 g
Na_2HPO_4 0.25 g
NaCl 0.5 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.4 ± 0.2
Autoclave at 121°C for 15 min.

141. CITRATE AGAR
NaCl 5.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$NH_4H_2PO_4$ 1.0 g
K_2HPO_4 1.0 g
Na-citrate 3.0 g
Bromothymol blue 0.08 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2

Autoclave at 121°C for 15 min.

142. PPYA
Potato decoction (see below) 200.0 ml
Peptone 5.0 g
Yeast extract 1.0 g
Agar 25.0 g
Distilled water to 1000.0 ml
pH 8.0.
Autoclave at 121°C for 15 min
Preparation of potato decoction: boil 200 g scrubbed and sliced potatoes in 1000.0 ml water for 1 hour, filter cold through a cotton-gauze filter, add water to the initial volume. Do not use new potatoes.

143. PEPTONE MEAT AGAR WITH 1% GLYCEROL
Peptone 10.0 g
Beef extract 3.0 g
NaCl 5.0 g
Glycerol 10.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0-7.2
Autoclave at 121°C for 15 min.

144. PEPTONE MEAT AGAR WITH 0.5% GLUCOSE
Peptone 10.0 g
Beef extract 3.0 g
NaCl 5.0 g
Glucose 5.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0-7.2
Autoclave at 111°C for 30 min

145. *PSEUDOMONAS* SP. (*ARTHROBACTER GLOBIFORMIS*) MEDIUM
Glucose 10.0 g
Maize extract 10.0 g
Tap water 1000.0 ml
pH 7.8 (adjust with NH_4OH); paper filter.
Autoclave at 111°C for 30 min.

146. DILUTED TRYPTICASE SOY MEDIUM
Trypticase Soy Broth (BBL 11768, Oxoid CM129 or Merck 5459) 3.0 g or
Pancreatic digest of casein 1.8 g
Papaic digest of soyabean 0.6 g
NaCl 0.6 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.3
Autoclave at 121°C for 15 min.

147. *HYPHOMICROBIUM* MEDIUM
$NaNO_3$ 1.0 g
NaCl 0.5 g

K_2HPO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Methanol 5.0-10.0 ml
Distilled water 1000.0 ml
pH 6.8-7.0
Autoclave at 121°C for 15 min. Methanol is filter sterilized.
Grow in an exicator in the presence of methanol vapors.

148. GLUCOSE YEAST CHALK MEDIUM
Beef extract 3.0 g
Yeast extract 10.0 g
Glucose 50.0 g
$CaCO_3$ 30.0 g
Agar 20.0 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.

149. *CLAVIBACTER XYLI* MEDIUM
Solution 1:
Flour agar 5.0 g
Papaya hydrolysate of soybean meal 8.0 g
K_2HPO_4 1.0 g
KH_2PO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Distilled water 965.0 ml
Solution 2:
Bovine hemine chloride (0.1% in 0.05 N NaOH) 15.0 ml
Solution 3:
Bovine serum albumin, fraction 5 (20%) 10.0 ml
Solution 4:
Glucose (50%) 1.0 ml
Solution 5:
Cysteine (10%) 10.0 ml
pH 6.6
Autoclave solution 1 at 121°C for 15 min, cool to 50 C and add the filter-sterilized solutions 2-5.

150. GETCHINSON MEDIUM WITH FILTER PAPER
K_2HPO_4 1.3 g
$MgSO_4 \times 7\ H_2O$ 0.3 g
$CaCl_2 \times 6\ H_2O$ 0.1 g
$FeCl_3 \times 6\ H_2O$ 0.01 g
$NaNO_3$ 2.5 g
Distilled water 1000.0 ml
pH 7.2-7.3.
Autoclave at 121°C for 15 min. Cut filter paper into strips, sterilize by dry heat and immerse into the medium so that they are not completely in the liquid medium.

151. MUNZ MEDIUM FOR METHANE-OXIDIZING BACTERIA
K_2HPO_4 0.5 g
KH_2PO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
NH_4Cl 1.0 g
Tap water 1000.0 ml
pH 6.8

Autoclave at 121°C for 15 min.
Cultivate in the mixed atmosphere of air and methane (2:1).

152. TRYPTONE THIOGLYCOLATE MEDIUM
Solution 1:
K_2HPO_4 5.45 g
KH_2PO_4 1.2 g
$MgSO_4 \times 7\ H_2O$ 25.0 mg
$CaCl_2 \times 2\ H_2O$ 15.0 mg
$FeSO_4 \times 7\ H_2O$ 10.0 mg
$MnCl_2 \times 4\ H_2O$ 2.0 mg
$CoCl_2 \times 6\ H_2O$ 2.5 mg
$Na_2MoO_4 \times 2\ H_2O$ 2.5 mg
Peptone 2.0 g
Tryptone 2.0 g
Yeast extract 6.0 g
Na-thioglycolate 0.5 g
Distilled water 950.0 ml
Solution 2:
Glucose 20.0 g
Distilled water 50.0 ml
pH 7.5
Autoclave solution 1 at 121°C for 15 min, solution 2 at 111°C for 30 min.

153. MEDIUM P-2 FOR THERMOPHILIC ANAEROBIC BACTERIA
K_2HPO_4 3.0 g
KH_2PO_4 2.0 g
NH_4Cl 2.0 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Tryptone 10.0 g
Glucose 5.0 g
Yeast extract 5.0 g
Resazurin 0.0 1 g
Distilled water 1000.0 ml
pH 7.0-7.2
Prepare medium anaerobically under N_2 and autoclave at 121°C for 15 min. Autoclave glucose separately under N_2 at 111°C for 30 min.

154. *DESULFOVIBRIO SULFODISMUTANS* MEDIUM
Solution 1:
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 920.0 ml
Solution 2:
Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
$NaHCO_3$ 2.5 g
Distilled water 50.0 ml
Solution 4:

Na-acetate × 3 H_2O 0.3 g
Distilled water 10.0 ml
Solution 5:
D(+)-Biotin 10.0 mg
Ca-D(+)-Pantothenate 50.0 mg
Distilled water 1.0 ml
Solution 6:
Na_2S × 9 H_2O 0.4 g
Distilled water 10.0 ml
Solution 7:
$Na_2S_2O_3$ (0.5 M) 10.0 ml
pH 7.5-8.0 (adjust with NaOH)
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2$ × 4 H_2O 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2$ × 4 H_2O 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2$ × 6 H_2O 190.0 mg
$CuCl_2$ × 2 H_2O 2.0 mg
$NiCl_2$ × 6 H_2O 24.0 mg
Na_2MoO_4 × 2 H_2O 36.0 mg
Distilled water 990.0 ml
pH 7.1-7.4
Solution 1 is prepared and autoclaved anaerobically at under 80% N_2 + 20% CO_2 at 121°C for 15 min. Solutions 2, 4, 6 and 7 are gassed with N_2 and autoclaved separately at 121°C for 15 min. Solution 3 (gassed with N_2 + CO_2) and solution 5 (gassed with N_2) are filter-sterilized. Solutions with 2 to 7 are added to the sterile, cooled solution 1 in the sequence as indicated. When growth has started feed culture again with same amount of solution 7. After a further two days repeat feeding once more.

155. SCHATZ AND BOVELL MEDIUM FOR HYDROGEN-OXIDIZING BACTERIA
KH_2PO_4 1.0 g
NH_4NO_2 1.0 g
$MgSO_4$ × 7 H_2O 0.2 g
$FeSO_4$ × 7 H_2O 0.01 g
$CaCl_2$ × 2 H_2O 0.01 g
$NaHCO_3$ 0.5 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 6.8-7.2
Autoclave at 121°C for 15 min. Cultivate in a gas mixture of carbon dioxide, air and hydrogen (1:3:6).

156. MEDIUM FOR MYXOBACTERIA
Casein hydrolysate 2.5 g
Asparagine 2.5 g
K_2HPO_4 2.0 g
NaCl 1.0 g
$MgSO_4$ × 7 H_2O 0.1 g
$FeSO_4$ × 7 H_2O 0.0 3 g
$CaCl_2$ × 2 H_2O 0.01 g
Distilled water 1000.0 ml
pH 7.4
Autoclave at 121°C for 15 min.

157. EMERSON STARCH YEAST EXTRACT AGAR
Yeast extract 4.0 g
Starch (soluble) 15.0 g
KH_2PO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

158. GLYCEROL YEAST AGAR
Yeast extract 5.0 g
Glycerol 50.0 g
$CaCO_3$ 1.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0-7.2
Autoclave at 121°C for 15 min.

159. *SPHAEROTILUS* MEDIUM
Beef extract (Lab Lemco, Oxoid) 5.0 g
Agar (if necessary) 15.0 g
Distilled water 1000.0 ml
Adjust pH to 7.0.
Prepare sterile agar slants by autoclaving at 121°C for 15 min. Cool the slants in a sloping position. Cover solid slants with 2 ml sterile tap water. Inoculate into the covering tap water.

160. MEAT GLUCOSE MEDIUM
Peptone 10.0 g
Glucose 10.0 g
Beef extract 3.0 g
NaCl 5.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 111°C for 30 min.

161. *RHIZOBIUM* MEDIUM
Yeast extract 1.0 g
Mannitol 10.0 g
Agar 15.0 g
Soil extract (see below) 200.0 ml
Distilled water 800.0 ml
Soil extract:
Air-dried garden soil 80.0 g
Na_2CO_3 0.2 g
Distilled water 200.0 ml
Soil extract autoclave at 121°C for 1 h. filter and make up to 200 ml.
pH 7.2
Autoclave at 121°C for 15 min.

162. *ANCYLOBACTER-SPIROSOMA* MEDIUM
Glucose 1.0 g
Peptone 1.0 g
Yeast extract 1.0 g

Agar 15.0 g
Distilled water 1000.0 ml
pH 7.0-7.2
Autoclave at 111°C for 30 min.

163. *MICROCYCLUS* MEDIUM
Glucose 5.0 g
Peptone 5.0 g
Yeast extract 5.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 6.8
Autoclave at 111°C for 30 min.

164. PD BROTH FOR *FLEXIBACTER*
Peptone 1.0 g
KNO_3 100.0 mg
Yeast extract 100.0 mg
K_2HPO_4 66.7 mg
$MgSO_4 \times 7\ H_2O$ 33.3 mg
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
$Zn\ SO_4 \times 7\ H_2O$ 22.0 mg
$MnSO_4 \times 7\ H_2O$ 1.81 g
$CuSO_4 \times 5\ H_2O$ 79.0 mg
$NaBO_3 \times 4\ H_2O$ 1.0 g
$(NH_4)_6Mo_7O_{24} \times 4\ H_2O$ 9.3 g
$FeSO_4 \times 7\ H_2O$ 20.0 mg
$Co(NO_3)_2 \times H_2O$ 20.0 mg
Trilon B 10.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

165. INDICATOR MEDIUM WITH MALONATE
Yeast extract 1.0 g
$(NH_4)_2SO_4$ 2.0 g
KH_2PO_4 0.4 g
K_2HPO_4 0.6 g
NaCl 2.0 g
Na-malonate 3.0 g
Glucose 0.25 g
Bromothymol blue (0.2%) 12.0 ml
Distilled water 1000.0 ml
Dissolve components of the medium in boiling water in the specified sequence (except the indicator). Then filter through a cotton wool-gauze filter to remove the possible precipitate, bring to the initial volume, cool, adjust pH 6.7, add the indicator. Autoclave at 121°C for 15 min.

166. *CORYNEBACTERIUM* AGAR
Casein peptone, tryptic digest 10.0 g
Yeast extract 5.0 g
Glucose 5.0 g
NaCl 5.0 g

Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 111°C for 30 min.

167. PEPTONE MEAT AGAR WITH 3% NaCl
Peptone 10.0 g
Beef extract 3.0 g
NaCl 30.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

168. *CORYNEBACTERIUM* MEDIUM WITH 6% NaCl
Casein peptone, tryptic digest 10.0 g
Yeast extract 5.0 g
Glucose 5.0 g
NaCl 60.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

169. HETEROTROPHIC MEDIUM H3P
Solution 1:
KH_2PO_4 2.3 g
$Na_2HPO_4 \times 2\ H_2O$ 2.9 g
Distilled water 50.0 ml
Solution 2:
NH_4Cl 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.01 g
$MnCl_2 \times 4\ H_2O$ 0.0 5 g
$NaVO_3 \times H_2O$ 0.0 5 g
Trace element solution *SL-6* (see below) 5.0 ml
Agar (if necessary) 15.0 g
Distilled water 850.0 ml
Solution 3:
$Fe(NH_4)$-citrate 0.05 g
Distilled water 20.0 ml
Solution 4:
Yeast extract 1.0 g
Na-acetate $\times 3\ H_2O$ 1.0 g
Na_2-succinate 1.0 g
DL-Malate 1.0 g
Distilled water 30.0 ml
pH 7.0
Solution 5:
Na-lactate 1.0 g
Na-pyruvate 1.0 g
D-Mannitol 1.0 g
D-Glucose 2.0 g
Distilled water 50.0 ml

pH 7.0
Trace element solution SL-6:
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
Vitamin solution:
Riboflavin 10.0 mg
Thiamine-HCl × 2 H2O 50.0 mg
Nicotinic acid 50.0 mg
Pyridoxine-HCl 50.0 mg
Ca-pantothenate 50.0 mg
Biotin 0.1 mg
Folic acid 0.2 mg
Vitamin B_{12} 1.0 mg
Distilled water 100.0 ml
Solutions 1, 2, 3, 4 and trace element solution are autoclaved separately for 15 min at 121°C, cooled down to 50°C and then mixed aseptically with filter-sterilized solution 5 (at 50°C) and 5.0 ml of filter-sterilized standard vitamin solution. The final pH of this medium should be 6.8 without adjustment.

170. *CYTOPHAGA* MEDIUM
Yeast extract 10.0 g
NH_4Cl 1.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
K_2HPO_4 0.2 g
NaCl 20.0 g
$FeCl_3 \times 6\ H_2O$ Traces
Agar (if necessary) 2.0-3.0 g
Distilled water 1000.0 ml
pH 7.5
Autoclave at 121°C for 15 min.

171. YEAST AGAR
K_2HPO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
Yeast extract 10.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.0-7.2
Autoclave at 121°C for 15 min.

172. PEPTONE SUCCINATE AGAR
$(NH_4)_2SO_4$ 1.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$MnSO_4 \times 5\ H_2O$ 2.0 mg
$FeCl_3 \times 6\ H_2O$ 2.0 mg
Succinic acid 1.68 g
Peptone 5.0 g
Agar 1.5 g
Distilled water 1000.0 ml

pH 7.0
Autoclave at 121°C for 15 min.

173. *SPIRILLUM GRACILLE* MEDIUM
Peptone 5.0 g
Yeast extract 0.5 g
Tween 80 0.02 g
K_2HPO_4 0.1 g
Agar (if needed) 15.0 g
Tap water 1000.0 ml
pH to 7.2
Autoclave at 121°C for 15 min.

174. MEDIUM FOR DENTRIFYING BACTERIA (GILTAY MEDIUM)
Solution 1:
KNO_3 1.0 g
Asparagine 1.0 g
Distilled water 250.0 ml
Solution 2:
Ca-citrate 8.5 g
KH_2PO_4 1.0 g
Distilled water 500.0 ml
Solution 3:
$MgSO_4 \times 7\ H_2O$ 1.0 g
$FeCl_2 \times 4\ H_2O$ traces
$CaCl_2 \times 2\ H_2O$ 0.2 g
Distilled water 250.0 ml
Autoclave solutions separately at 121°C for 15 min and mix aseptically.

175. *AQUASPIRILLUM* MEDIUM 1
Peptone 2.0 g
Succinic acid 1.0 g
$(NH_4)_2SO_4$ 1.0 g
$MgSO_4 \times 7\ H_20$ 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.03 g
Vitamin solution (see below) 1.0 ml
Trace elements (see below) 1.0 ml
Agar (if needed) 15.0 g
Distilled water 1000.0 ml
Adjust pH to 7.4-7.6. Autoclave main medium and trace elements solution separately at 121°C for 15 min and add 1.0 ml/l vitamin solution from a filter sterilized stock solution.
Trace elements solution (Pfennig & Lippert, 1966):
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.2 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.03 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.03 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
pH 3.0-4.0
Vitamin solution:

Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
ρ-Aminobenzoic acid 50.0 mg
Distilled water 1000.0 ml

176. *METHANOBACTERIUM* MEDIUM
Solution 1:
NaCl 0.9 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
NH_4Cl 1.0 g
Yeast extract 2.0 g
Resazurin 0.01 g
Trace element solution (see below) 10.0 ml
Vitamin solution (see below) 5.0 ml
Buffer solution a (see below) 10.0 ml
Buffer solution b (see below) 10.0 ml
Distilled water 965.0 ml
Solution 2 (reducing agents):
L-Cysteine-HCl $\times$ H_2O 0.5 g
$Na_2S \times 9\ H_2O$ 0. 5 g
Distilled water 10.0 ml
Buffer solutions:
a) K_2HPO_4 29.0 g
Distilled water 100.0 ml
b) KH_2PO_4 15.0 g
Distilled water 100.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 mg
$FeSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 6\ H_2O$ 0.1 mg
$CoCl_2 \times 2\ H_2O$ 0.17 mg
$CaCl_2 \times 2\ H_2O$ 0.1 mg
$ZnCl_2$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
H_3BO_3 0.01 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.01 mg
NaCl 1.0 mg
Na_2SeO_4 0.017 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg

Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4
Prepare medium in anaerobic conditions, blowing through with N_2 without O_2 up to sterilization. Solutions of reducing agents (10.0 ml) and others solutions add to base medium after separate autoclaving at 121°C for 15 min. Sterilize vitamin solution by filtration.
Cultivate in a gas mixture of 80% H_2 and 20% CO_2.

177. *CYTOPHAGA LYTICA* MEDIUM
Starch (soluble) 10.0 g
Yeast extract 1.0 g
Beef extract 1.0 g
Pancreatic casein hydrolysate 2.0 g
$CoCl_2 \times 6\ H_2O$ 0.02 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.3
Autoclave at 121°C for 15 min.

178. MEDIUM FOR MARINE *CYTOPHAGA*
Solution 1:
Yeast extract 1.0 g
Tryptone 1.0 g
KCl 0.7 g
NaCl 24.7 g
$MgSO_4 \times 7\ H_2O$ 6.3 g
$MgCl_2 \times 6\ H_2O$ 4.6 g
Agar 15.0 g
Distilled water 950.0 ml
Solution 2:
$CaCl_2 \times 2\ H_2O$ 1.2 g
Distilled water 25.0 ml
Solution 3:
$NaHCO_3$ 0.2 g
Distilled water 25.0 ml
pH 7.2
Autoclave solutions separately at 121°C for 15 min and mix aseptically.

179. *SELENOMONAS RUMINANTIUM* MEDIUM
Glucose 1.0 g
Trypticase 5.0 g
KH_2PO_4 1.0 g
Na-acetate $\times 3\ H_2O$ 4.0 g
Yeast extract 2.0 g
Valeric acid 0.1 ml
Resazurin 1.0 mg
Na_2CO_3 4.0 g
L-Cysteine-HCl $\times\ H_2O$ 0.5 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.
Gas atmosphere: 100% CO_2.

180. *DESULFOVIBRIO CARBINOLICUS* MEDIUM

Solution 1:

Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Distilled water 870.0 ml

Solution 2:

Trace element solution *SL-10* (see below) 1.0 ml

Solution 3:

$NaHCO_3$ 5.0 g
Distilled water 100.0 ml

Solution 4:

Ethanol 0.7 g
Casamino acids 0.1 g
Yeast extract 0.1 g
Distilled water 10.0 ml

Solution 5:

Vitamin solution (see below) 10.0 ml

Solution 6:

$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml

Trace element solution SL-10:

HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml

Vitamin solution:

Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
Ca DL-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml

Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9-7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution is filter sterilized. Others solutions autoclave at 121°C for 15 min and add to base medium aseptically.

Final pH of the complete medium 7.1-7.4

181. CASEIN-CITRATE AGAR
Casein hydrolysate 7.5 g
Yeast extract 10.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
Na-citrate 3.0 g
KCl 2.0 g
NaCl 200.0 g
4.98% $FeSO_4$ in 0.0 1 N HCl 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.4
Autoclave at 121°C for 15 min.

182. *DESULFOBACTERIUM* MEDIUM
Solution 1:
Na_2SO_4 3.0 g
KH_2PO_4 0.2 g
NH_4Cl 0.3 g
NaCl 21.0 g
$MgCl_2 \times 6\ H_2O$ 3.0 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
Resazurin 1.0 mg
Distilled water 930.0 ml
Solution 2:
Trace element solution *SL-10* (see below) 1.0 ml
Solution 3:
Vitamin solution (see below) 10.0 ml
Solution 4:
$NaHCO_3$ 2.5 g
Distilled water 50.0 ml
Solution 5:
$Na_2SeO_3 \times 5\ H_2O$ (3 mg in 1000.0 ml 0.01 M NaOH) 1.0 ml
Solution 6:
$Na_2S \times 9\ H_2O$ 0.4 g
Distilled water 10.0 ml
Solition 7:
Substrate - depending on the species of bacteria:
25% Na-acetate 10.0 ml or indole 0.3 g
NaCl 2.1 g
$MgCl_2 \times 6\ H_2O$ 0.3 g
Distilled water 100.0 ml
Phenol 40.0 mg
or Na-benzoate 400.0 mg
Distilled water 4.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg

$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
p-Aminobenzoic acid 4.0 mg
D(+)-Biotin 1.0 mg
Thiamine-HCl 10.0 mg
Distilled water 100.0 ml
pH 7.1-7.4
Solution 1 is prepared and autoclaved anaerobically under 80% N_2 + 20% CO_2 at 121°C for 15 min. Solutions 2, 4, 5 and 6 are gassed with N_2 and autoclaved separately at 121°C for 15 min. Solution 3 (gassed with N_2 + CO_2) and solution 7 (gassed with N_2) are filter-sterilized.

183. BENETT MEDIUM
Yeast extract 1.0 g
Meat extract 1.0 g
Fermentative casein hydrolysate 2.0 g
Glucose 10.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

184. ISP 2 MEDIUM
Glucose 4.0 g
Yeast extract 4.0 g
Malt extract 10.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

185. *HALOBACTERIUM* MEDIUM 4
Yeast extract 5.0 g
Casamino acids 5.0 g
Na-glutamate 1.0 g
KCl 2.0 g
Na-citrate 3.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
NaCl 200.0 g
$FeCl_2 \times 4\ H_2O$ 36.0 mg
$MnCl_2 \times 4\ H_2O$ 0.36 mg
Agar 20.0 g
Distilled water to 1000.0 ml
pH 7.0-7.2
Autoclave at 111°C for 30 min.

186. *HALOBACTERIUM* MEDIUM 5
Solution 1:
Casamino acids 7.5 g
Yeast extract 10.0 g
Na-citrate 3.0 g
KCl 2.0 g

$MgSO_4 \times 7\ H_2O$ 20.0 g
$FeSO_4 \times 7\ H_2O$ 0.05 g
$MnSO_4 \times H_2O$ 0.2 g
NaCl 250.0 g
Distilled water 750.0 ml
Solution 2:
Agar 20.0 g
Distilled water 250.0 ml
pH 7.4
Autoclave separately at 121°C for 15 min and mix aseptically.

187. *HALOCOCCUS* MEDIUM
Solution 1:
Skim milk 50.0 g
Distilled water 500.0 ml
Solution 2:
$MgSO_4 \times 7\ H_2O$ 10.0 g
KNO_3 2.0 g
NaCl 200.0 g
Fe-citrate traces
Distilled water 100.0 ml
Solution 3:
Neopeptone 5.0 g
Glycerol 10.0 g
Agar 25.0 g
Distilled water 400.0 ml
Autoclave of solution 1 at 111°C for 15 min. Mix together heated solutions 2 and 3, adjust pH of the mixture to 8.4 and autoclave at 121°C for 15 min.

188. *NATRONOBACTERIUM* MEDIUM
Solution 1:
KH_2PO_4 1.0 g
KCl 1.0 g
NH_4Cl 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.24 g
$CaSO_4 \times 2\ H_2O$ 0.17 g
Trace element solution *SL-10* (see below) 1.0 ml
NaCl 200.0 g
Glutamate 1.0 g
Yeast extract 5.0 g
Casamino acids 5.0 g
Agar, if necessary (heat and dissolve it before adding sodium chloride) 20.0 g
Distilled water to 1000.0 ml
pH 6.5
Solution 2:
Na_2CO_3 5.0 g
Distilled water 50.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg

$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
pH 9.0-9.5
Autoclave separately at 121°C for 15 min and mix aseptically.

189. *HALOBACTERIUM* MEDIUM 6
NaCl 156.0 g
$MgCl_2 \times 6\ H_2O$ 13.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
$CaCl_2 \times 2\ H_2O$ 1.0 g
KCl 4.0 g
$NaHCO_3$ 0.2 g
NaBr 0.5 g
Yeast extract 5.0 g
Glucose 1.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

190. PRAUSER MEDIUM 79
Glucose 10.0 g
Peptone 10.0 g
Yeast extract 2.0 g
Casamino acids 2.0 g
NaCl 6.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.5
Autoclave at 111°C for 30 min.

191. STARCH-YEAST AGAR
Yeast extract 2.0 g
Starch (soluble) 10.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.3
Autoclave at 121°C for 15 min.

192. MYA-AGAR
Glucose 2.0 g
L-Asparagine 1.0 g
K_2HPO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
Trace element solution (see below) 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
Trace element solution:
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CuSO_4 \times 5\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 100.0 ml
pH 7.4

Autoclave base medium at 111°C for 30 min, trace element solution at 121°C for 15 min.

193. ACETATE AGAR
NaCl 5.0 g
K_2HPO_4 1.0 g
$NH_4H_2PO_4$ 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
Na-acetate $\times 3\ H_2O$ 2.0 g
Bromothymol blue (0.2%) 40.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Add the indicator last, after pH is set and the possible precipitate is separated by filtration through a cotton wool-gauze filter.
Autoclave at 121°C for 15 min.

194. INMI MEDIUM 3
NaCl 250.0 g
KCl 2.0 g
Na-citrate 3.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
Casamino acids 5.0 g
Yeast extract 2.5 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C for 15 min.

195. INMI MEDIUM 4
Yeast extract 2.5 g
Casamino acids 5.0 g
pH 9.5
Autoclave at 121°C for 15 min.

196. MEDIUM FOR PURPLE BACTERIA (VAN NIEL MEDIUM)
NH_4Cl 1.0 g
K_2HPO_4 0.5 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$NaHCO_3$ 1.0 g
$Na_2S \times 9\ H_2O$ 1.0 g
Tap water 1000.0 ml
pH 7.6
Autoclave base medium and sulfide separately at 121°C for 15 min.

197. MEDIUM FOR *RHODOSPIRILLUM* (PFENNIG MEDIUM)
NH_4Cl 0.4 g
KH_2PO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
NaCl 0.4 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Acetate, or butyrate, or propionate, or succinate 1.0 g
Yeast extract 0.2 g
Fe-citrate (0.1%) 5.0 ml
Trace element solution according to *Pfennig* (see below) 1.0 ml

Vitamin B_{12} (dispensary solution, 0,01%) 1.0 ml
Distilled water 1000.0 ml
Trace element solution according to Pfennig:
EDTA 1.5 g
Trace element solution according to *Hogland* (see below) 6.0 ml
$FeSO_4 \times 7\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.02 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 1000.0 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml
Autoclave base medium and trace element solution separately at 121°C for 15 min.

198. *THIOBACILLUS DENITRIFICANS* MEDIUM (TAYLOR MEDIUM)
KNO_3 2.0 g
NH_4Cl 1.0 g
KH_2PO_4 2.0 g
$NaHCO_3$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.8 g
$Na_2S_2O_3 \times 5\ H_2O$ 5.0 g
Trace element solution according to *Pfennig* (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution according to Pfennig:
EDTA 1.5 g
Trace element solution according to *Hogland* (see below) 6.0 ml
$FeSO_4 \times 7\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.02 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 1000.0 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml
Autoclave base medium and trace element solution separately at 121°C for 15 min.

199. *THIOBACILLUS DENITRIFICANS* MEDIUM (BAALSRUD MEDIUM)
KNO_3 2.0 g
NH_4Cl 0.5 g

KH_2PO_4 2.0 g
$NaHCO_3$ 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.5 g
$Na_2S_2O_3 \times 5\ H_2O$ 5.0 g
$FeSO_4 \times 7\ H_2O$ 0.01 g
Distilled water 1000.0 ml
pH 7.0
Autoclave stock solutions of iron, phosphorus and bicarbonate salts separately at 121°C for 15 min.

200. *THIOBACILLUS DENITRIFICANS* MEDIUM (LIESKE MEDIUM)
KNO_3 5.0 g
KH_2PO_4 0.2 g
$NaHCO_3$ 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
$Na_2S_2O_3 \times 5\ H_2O$ 5.0 g
$CaCl_2 \times 2\ H_2O$ Traces
$FeCl_3 \times 6\ H_2O$ Traces
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.

201. MODIFIED BROCK MEDIUM FOR SULFUROXIDIZING BACTERIA
$(NH_4)_2SO_4$ 1.3 g
KH_2PO_4 0.37 g
$MgSO_4 \times 7\ H_2O$ 0.25 g
$CaCl_2 \times 6\ H_2O$ 0.07 g
Distilled water 1000.0 ml
pH 2.4 (range: 2.3-3.0; adjust with H_2SO_4).
Additions to the medium
Trace element solution according to *Pfennig* (see below) 1.0 ml
Yeast extract 0.2 g
Element sulfur 10.0 g
Chalk ($CaCO_3$) 10.0 g
For cultivation of heterotrophic representatives of the group the medium after sterilization is to be also supplemented with
Peptone 1.75 g
Sucrose 0.25 g
Trace element solution according to Pfennig:
EDTA 1.5 g
Trace element solution according to *Hogland* (see below) 6.0 ml
$FeSO_4 \times 7\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.02 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 1000.0 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml

Autoclave base medium and others components of medium separately at 121°C for 15 min.

202. MEDIUM FOR MAGNETIC BACTERIA

Tartaric acid 0.37 g
Succinic acid 0.37 g
Na-acetate × 3 H_2O 0.05 g
KH_2PO_4 0.68 g
$NaNO_3$ 0.12 g
Vitamin solution (see below) 10.0 ml
Trace element solution (see below) 5.0 ml
Fe-quinate 2.0 ml
Na-thioglycolate 0.05 g
Resazurin 0.5 mg
Agar 1.3 g
Bidistilled water 1000.0 ml
Vitamin solution:
Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
p-Aminobenzoic acid 50.0 mg
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 g
$FeCl_2$ × 4 H_2O 0.2 g
$MnCl_2$ × 4 H_2O 0.1 g
$CoCl_2$ × 6 H_2O 0.17 g
$CaCl_2$ × 2 H_2O 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2$ × 2 H_2O 0.02 g
Na_2MoO_4 × 2 H_2O 0.01 g
$NiCl_2$ × 6 H_2O 0.026 g
NaCl 1.0 g
Na_2SeO_3 × 5 H_2O 0.02 g
Distilled water 1000.0 ml
pH 6.75 (adjust with NaOH)
Prior to sterilization the medium is to be blown down by the flow of N_2 and autoclaved in the nitrogen atmosphere at 121°C for 15 min. Vitamin solution is filter sterilized. Trace element solution autoclave at 121°C for 15 min and add to base medium aseptically.

203. MEDIUM FOR *FLEXIBACTER* (LEWIN MEDIUM)

Na-glycerophosphate 0.1 g
KNO_3 0.1 g
$MgSO_4$ × 7 H_2O 0.1 g
Trace element solution (see below) 1.0 ml
Vitamin B_{12} 1.0 mg
$CaCl_2$ × 2 H_2O 0.1 g
Tris 1.0 g
Thiamine 1.0 mg
Casamino acids 1.0 g

Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 g
$FeCl_2 \times 4\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$CoCl_2 \times 6\ H_2O$ 0.17 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2 \times 2\ H_2O$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.026 g
NaCl 1.0 g
$Na_2SeO_3 \times 5\ H_2O$ 0.02 g
Distilled water 1000.0 ml
pH 7.5
Autoclave base medium and trace element solution separately at 121°C for 15 min.

204. MEDIUM FOR *CLOSTRIDIUM*
Glucose 10.0 g
Peptone 12.0 g
NaCl 2.0 g
Agar 16.0 g
Distilled water 1000.0 ml
The medium can be used with chalk addition as buffer against acidification of the medium during cultivation.
pH to 6.8-7.2
Autoclave at 111°C for 30 min.

205. OATMEAL AGAR A
Oatmeal or oat flakes 20.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH to 7.2
Boil oat flakes in water bath for 20 min filter through a cotton-gauze filter, fill up to 1000.0 ml.
Autoclave at 121°C 15 min.

206. ISP MEDIUM 3
Oatmeal 20.0 g
Salt solution A (see below) 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
Salt solution A:
$FeSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 100.0 ml
Boil oat flakes in water bath for 20 min filter through a cotton-gauze filter, fill up to 1000.0 ml.
pH 7.2
Autoclave separately at 121°C 15 min.

207. MINERAL AGAR 1
Starch (soluble) 20.0 g
K_2HPO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g

KNO_3 1.0 g
NaCl 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.01 g
Agar 30.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C 15 min.

208. GLUCOSE ASPARAGINE AGAR
Glucose 10.0 g
L-Asparagine 0.5 g
K_2HPO_4 0.5 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 6.8.
Autoclave at 111°C for 30 min.

209. MODIFICATION OF THE CZAPEK MEDIUM WITH STARCH
Starch (soluble) 20.0 g
K_2HPO_4 0.5 g
KNO_3 1.0 g
NaCl 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.3 g
$CaCO_3$ 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.0 1 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C 15 min.

210. GLYCEROL-ASPARAGINE AGAR
L-Asparagine 1.0 g
Glycerol 10.0 g
K_2HPO_4 1.0 g
Salt solution A (see below) 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
Salt solution A:
$FeSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 100.0 ml
pH 7.0-7.4
Autoclave separately at 121°C 15 min.

211. OATMEAL AGAR WITH 0.1% YEAST EXTRACT
Oatmeal 20.0 g
Yeast extract 1.0 g
Agar 20.0 g
Tap water 1000.0 ml
pH 7.2
Boil oat flakes in water bath for 20 min filter through a cotton-gauze filter, fill up to 1000.0 ml.
Autoclave at 121°C 15 min.

212. MODIFICATION OF CZAPEK MEDIUM WITH GLUCOSE
Glucose 20.0 g
K_2HPO_4 0.5 g
KNO_3 1.0 g
NaCl 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.3 g
$CaCO_3$ 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.0 1 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2-7.4
Autoclave at 111°C for 30 min.

213. ORGANIC AGAR 2
Hottinger broth (HiMedia M1425) 0.69 g
Peptone 5.0 g
NaCl 5.0 g
Glucose 10.0 g
Agar 30.0 g
Tap water 1000.0 ml
pH 7.0-7.2
Autoclave at 111°C for 30 min.

214. STARCH AMMONIA AGAR
Starch (soluble) 10.0 g
K_2HPO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
NaCl 1.0 g
$(NH_4)_2SO_4$ 2.0 g
$CaCO_3$ 2.0 g
Salt solution A (see below) 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
Salt solution A:
$FeSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 100.0 ml
pH 7.0-7.4
Autoclave separately at 121°C 15 min.

215. GLYCEROL NITRATE AGAR
Glycerol 30.0 g
$NaNO_3$ 2.0 g
K_2HPO_4 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
KCl 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.01 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0-7.2.
Autoclave at 121°C for 15 min.

216. TETRATHIONATE BROTH (MULLER MEDIUM)

Solution 1:
Hottinger broth (HiMedia M1425) 20.24 g
Distilled water 880.0 ml
Solution 2:
Lugol solution (see below) 20.0 ml
Solution 3:
50% $Na_2S_2O_3 \times 5\ H_2O$ 100.0 ml
Lugol solution:
KI 20.0 g
I_2 25.0 g
Distilled water 100.0 ml
pH 7.2 - 7.4
Autoclave solution 3 at 121°C 15 min. Lugol solution is filter sterilized. Pour the medium into sterile vials with $CaCO_3$ (25 g $CaCO_3$ per 1000.0 ml of medium). Sterilize the flasks with $CaCO_3$ with dry heat (170 C for 60 min).

217. MEDIUM FOR MICROMONOSPORES
Glucose 10.0 g
Starch (soluble) 20.0 g
Yeast extract 5.0 g
Fermentative casein hydrolysate 5.0 g
$CaCO_3$ 1.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

218. PYA WITH MARINE WATER
Peptone 5.0 g
Yeast extract 3.0 g
Agar 12.0 g
Distilled water 250.0 ml
Aged filtered sea water 750.0 ml
pH 7.5-7.6
Autoclave at 121°C 15 min.

219. MEDIUM FOR HALOPHILIC BACILLI
NaCl 100.0 g
$NaHCO_3$ 10.0 g
Na_2CO_3 10.0 g
Nutrient broth 1000.0 ml
pH 9.5
Autoclave at 121°C 15 min.

220. PYEA MEDIUM
Peptone 10.0 g
Yeast extract 10.0 g
NaCl 5.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C 15 min.

221. MEDIUM FOR METHANOTROPHIC BACTERIA

KNO_3 1.0 g
KH_2PO_4 0.7 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
$Na_2HPO_4 \times 12\ H_2O$ 1.5 g
EDTA 5.0 mg
$FeSO_4 \times 7\ H_2O$ 2.0 mg
$ZnSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.03 mg
$CoCl_2 \times 6\ H_2O$ 0.2 mg
$CuCl_2 \times 2\ H_2O$ 0.1 mg
$NiCl_2 \times 6\ H_2O$ 0.02 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.03 mg
Distilled water 1000.0 ml
pH 6.7-7.1
Autoclave at 121°C 15 min.
Cultivation under mixture of methane and air (1:1).

222. MEDIUM FOR MARINE METHYLOTROPHIC BACTERIA
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
NaCl 30.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g
$FeSO_4 \times 7\ H_2O$ 0.0 2 g
Yeast extract 0.1 g
Methanol 5.0 ml
Biotin 0.01 mg
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C 15 min. After autoclaving add filter sterilize methanol and biotin.

223. MEDIUM FOR OLIGOCARBOPHILIC BACTERIA
Solution 1 (basic solution):
Peptone 0.25 g
Yeast extract 0.25 g
Agar 5.0 g
Solution 2 20.0 ml
Distilled water 965.0 ml
Glucose (2.5 %) 10.0 ml
Solution 3 5.0 ml
pH 7.5
Solution 2 (trace elements):
Nitrilotriacetic acid 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 12.67 mg
$FeSO_4 \times 7\ H_2O$ 350.0 mg
Na-EDTA 125.0 mg
$ZnSO_4 \times 7\ H_2O$ 548.0 mg
$MnSO_4 \times H_2O$ 77.0 mg
$CuSO_4 \times 5\ H_2O$ 20.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 12.4 mg
$Na_2B_4O_7 \times 10\ H_2O$ 8.8 mg
Distilled water 950.0 ml

Dissolve nitrilotriacetic acid first by neutralizing with KOH, then add other salts. Adjust volume to 1000.0 ml.
Adjust pH to 7.2
Solution 3 (vitamin solution):
Biotin 4.0 mg
Folic acid 4.0 mg
Pyridoxine-HCl 20.0 mg
Riboflavine 10.0 mg
Thiamine-HCl 10.0 mg
Nicotin amide 10.0 mg
Ca-D-pantothenate 10.0 mg
Vitamin B_{12} 0.2 mg
p-Aminobenzoic acid 10.0 mg
Distilled water 1000.0 ml
pH 6.8–7.0
Autoclave glucose stock solution at 111°C for 30 min, solutions 1 and 2 at 121°C 15 min. Vitamin solution is filter sterilized. Store in refrigerator at +5 C.

224. MEDIUM FOR *DESULFOTOMACULUM ALKALIPHILUM*
Solution 1 (basic solution):
Na_2CO_3 0.5 g
Na_2SO_4 5.0 g
NaCl 5.0 g
Na formate 5.0 g
Yeast extract 1.0 g
Solution 2 (see below) 10.0 ml
Solution 3 (see below) 2.0 ml
Solution 4 (see below) 1.0 ml
Rezazurine traces
Distilled water 1000.0 ml
$NaHCO_3$ final concentration 8.0 g /1000.0ml
$Na_2S \times 9\ H_2O$ final concentration 0.5 g/1000.0 ml
Solution 2:
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 1.0 g
KCl 0.2 g
Distilled water 1000.0 ml
Solution 3 (vitamin solution):
Biotin 10.0 mg
Folic acid 10.0 mg
Pyridoxine-HCl 50.0 mg
Riboflavine 25.0 mg
Thiamine-HBr 25.0 mg
Nicotin amide 25.0 mg
D-pantothenate 25.0 mg
Vitamin B_{12} 0.5 mg
p-Aminobenzoic acid 25.0 mg
Thioctic acid 25.0 mg
Distilled water 500.0 ml
Store in refrigerator at +5°C.
Solution 4 (trace elements):
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Fe $(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 400.0 mg

$FeSO_4 \times 7\ H_2O$ 200.0 mg
$ZnSO_4 \times 7\ H_2O$ 200.0 mg
$MnCl_2 \times 4\ H_2O$ 720.0 mg
$NiCl_2 \times 6\ H_2O$ 100.0 mg
$CuSO_4 \times 5\ H_2O$ 20.0 mg
$AlK(SO_4)_2 \times 12\ H_2O$ 20.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
H_3BO_3 20.0 mg
HCl 5.0 ml
Distilled water 200.0 ml
pH of the autoclaved medium is 8.7-9.0
Vitamin solution is filter sterilized. Others solutions autoclave separately at 121°C for 15 min and add to the Solution 1 after cooling.

225. 1/5 STARCH-YEAST AGAR
Yeast extract 0.4 g
Soluble starch 2.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.3
Autoclave at 121°C 15 min.

226. MEDIUM FOR *ACTINOPOLYSPORA MORTIVALLIS*
Bacto vitamin assay casamino acids 7.5 g
Yeast extract 10.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
Trisodium citrate $\times 2\ H_2O$ 3.0 g
KCl 2.0 g
NaCl 150.0 g
4.98% $FeSO_4$ in 0.01 N HCl 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.4
Autoclave at 121°C 15 min.

227. *MICROLUNATUS* MEDIUM
Glucose 0.5 g
Peptone 0.5 g
Yeast extract 0.5 g
Na- glutamate 0.5 g
KH_2PO_4 0.44 g
$(NH_4)_2SO_4$ 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 111°C for 30 min.

228. *MICROCOCCUS HALOPHILUS* MEDIUM
Peptone 10.0 g
Yeast extract 5.0 g
Malt extract 5.0 g
Casamino acids 5.0 g
Meat extract 2.0 g
Glycerol 2.0 g

Tween-80 50.0 mg
$MgSO_4 \times 7\ H_2O$ 1.0 g
NaCl 50.0 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C 15 min.

229. *ALKALIBACTER* MEDIUM
$(NH_4)_2SO_4$ 1.0 g
NH_4Cl 0.4 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.1 g
K_2HPO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
NaCl 10.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 mg
Trace element solution (see below) 10.0 ml
Resazurin 0.01 g
Yeast extract 0.25 g
Tryptone 2.0 g
Glucose 5.0 g
Vitamin solution (see below) 10.0 ml
L-cysteine 0.5 g
Na_2CO_3 (5% w/v) 50.0 ml
Distilled water 930.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 mg
$FeSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$CoCl_2 \times 2\ H_2O$ 0.17 mg
$CaCl_2 \times 2\ H_2O$ 0.1 mg
$ZnCl_2$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
H_3BO_3 0.01 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.01 mg
NaCl 1.0 mg
Na_2SeO_4 0.017 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Basal medium autoclave at 111°C for 30 min. Vitamin solution is filter sterilized. Others solutions autoclave at 121°C for 15 min (Na_2CO_3 is autoclaved under 100% N_2).
Final pH 9.0

230. *CALDITHRIX ABYSSI* MEDIUM
Sea salt 37.9 g
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
Resazurin 0.5 mg
Yeast extract (20% w/v) 15.0 ml
Trace element solution (see below) 10.0 ml
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ (3% w/v) 20.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Distilled water 900.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 mg
$FeSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$CoCl_2 \times 2\ H_2O$ 0.17 mg
$CaCl_2 \times 2\ H_2O$ 0.1 mg
$ZnCl_2$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
H_3BO_3 0.01 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.01 mg
NaCl 1.0 mg
Na_2SeO_4 0.017 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Prepare medium anaerobically under 80% N_2 + 20% CO_2 gas mixture. After autoclaving add from separately prepared, sterile anaerobic stock solutions $NaHCO_3$ (5% w/v) 50.0 ml. Vitamin solution is filter sterilized. Others solutions autoclave separately at 121°C for 15 min.
Final pH of the medium to 6.8

231. *CARBOXYDOCELLA SPOROPRODUCENS* MEDIUM
KCl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.52 g
$CaCl_2 \times 2\ H_2O$ 0.29 g
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
$NaHCO_3$ 1.0 g

Trace element solution *SL-4* (see below) 10.0 ml
Resazurin 0.5 mg
Vitamin solution (see below) 10.0 ml
Pyruvate 2.5 g
Yeast extract 0.05 g
$Na_2S \times 9\ H_2O$ 0.3 g
Distilled water 1000.0 ml
Trace element solution SL-4:
EDTA 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.2 g
Trace element solution *SL-6* (see below) 100.0 ml
Distilled water 900.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Trace element solution SL-6:
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, yeast extract, vitamins, pyruvate and sulfide, boil medium for 1 min, then cool to room temperature under N_2 gas atmosphere. Dispense medium under same gas atmosphere in tubes or serum bottles and autoclave at 121°C for 15 min. Add vitamins (sterilized by filtration), yeast extract, pyruvate and sulfide from sterile anoxic stock solutions prepared under N_2 gas atmosphere and bicarbonate from a sterile anoxic solution prepared under 80% N_2 and 20% CO_2 gas mixture (all solutions autoclave separately at 121°C 15 min). Adjust pH to 7.0 with a sterile anoxic solution of 10% (w/v) $NaHCO_3$. Inoculated vessels are pressurized with carbon monoxide gas to 2 bar overpressure.

232. *CARBOXYDOTHERMUS FERRIREDUCENS* MEDIUM
KH_2PO_4 0.33 g
NH_4Cl 0.33 g
KCl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
$NaHCO_3$ 2.0 g
Glycerol (87%) 3.0 ml
Vitamin solution (see below) 10.0 ml
Trace element solution *SL-10* (see below) 1.0 ml
$NiCl_2 \times 6\ H_2O$ 200.0 µg
$Na_2SeO_3 \times 5\ H_2O$ 120.0 µg

$Na_2WO_4 \times 2\ H_2O$ 30.0 µg
Yeast extract 1.0 g
Na_2-9,10-anthraquinone-2,6-disulfonate (Sigma A9706) 8.25 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Dissolve ingredients (except $CaCl_2 \times 2\ H_2O$, $NaHCO_3$, and vitamins), boil medium for some minutes to dissolve the anthraquinone, then cool under 80% N_2 and 20% CO_2 gas atmosphere to room temperature. Add solid $NaHCO_3$ and adjust medium pH to 6.8 with NaOH. Dispense medium in tubes or bottles under same gas. Autoclave at 121°C for 15 min. Before use, add $CaCl_2 \times 2\ H_2O$ and vitamins from anoxic, sterile stock solutions. Vitamin solution is filter sterilized. $CaCl_2 \times 2\ H_2O$ and trace element solution Autoclave at 121°C for 15 min

233. *CLOSTRIDIUM ALKALICELLULOSI* MEDIUM
NH_4Cl 0.5 g
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
KCl 0.2 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Na_2CO_3 1.0 g
$NaHCO_3$ 7.6 g
NaCl 10.0 g
Yeast extract 0.2 g
Cellobiose 3.0 g
$Na_2S \times 9\ H_2O$ 0.5 g
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg

$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Dissolve ingredients except cellobiose and sulfide, flush medium with N_2 gas for 30–60 min, dispense under N_2 gas atmosphere and autoclave at 121°C 15 min. Add cellobiose after autoclaving from an anoxic stock solution sterilized by filtration and sulfide from a sterile (Autoclave at 121°C 15 min), anoxic stock solution prepared under N_2.
Final pH of the medium 8.8-9.0.

234. *DESULFOHALOBIUM UTAHENSE* MEDIUM
NaCl 100.0 g
$MgSO_4 \times 7\ H_2O$ 10.0 g
KCl 6.0 g
$CaCl_2 \times 2\ H_2O$ 0.4 g
NH_4Cl 1.0 g
KH_2PO_4 0.1 g
Yeast extract 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
$NaHCO_3$ 4.0 g
Na-(L)-lactate 2.5 g
Resazurin 0.5 mg
$Na_2S \times 9\ H_2O$ 0.3 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Dissolve ingredients (except lactate, bicarbonate and sulfide), boil medium for 1 min, then cool to room temperature under 80% N_2 and 20% CO_2 gas mixture. Dispense under same gas atmosphere in culture vessels and autoclave at 121°C 15 min. Add sodium lactate and sulfide from sterile anoxic stock solutions prepared under N_2 and bicarbonate from a sterile stock solution prepared under 80% N_2 and 20% CO_2 (all solutions sterilize separately at 121°C 15 min).
Final pH of the medium 7.0-7.2

235. *DESULFONATRONUM COOPERATIVUM* MEDIUM

KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 1.0 g
KCl 0.2 g
Na_2SO_4 5.0 g
NaCl 10.0 g
Na_2CO_3 3.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
Yeast extract 1.0 g
Resazurin 0.5 mg
Na-formate 4.0 g
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve the ingredients (except formate, vitamin solution and sulfide) and flush medium with 100 % N_2 for 30 min. Add the sodium sulfide, adjust the pH to 8.8-9.0, dispense in Hungate tubes under N_2, and autoclave at 121°C 15 min. Before use add sodium formate and vitamin solution from a sterile, anaerobic stock solution (autoclave sodium formate 121°C 15 min and vitamin solution by filtration).

236. *DESULFOTOMACULUM CARBOXYDIVORANS* MEDIUM
Solution 1:
NaCl 1.17 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.3 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
NH_4Cl 0.27 g
KH_2PO_4 0.2 g
Na_2SO_4 2.84 g
Na-pyruvate 2.2 g
Yeast extract 0.5 g
Vitamin solution (see below) 1.0 ml

Trace element solution 1.0 ml (see below)
Distilled water 940.0 ml
Solution 2:
$Na_2S \times 9\ H_2O$ 0.36 g
Distilled water 10.0 ml
Sodium bicarbonate for alkalization:
$NaHCO_3$ 4.5 g
Distilled water 50.0 g
Vitamin solution:
p-Aminobenzoic acid 4.0 mg
D(+)-Biotin 1.0 mg
Thiamine-HCl 10.0 mg
Distilled water 100.0 ml
Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 68.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 62.0 mg
$CoCl_2 \times 6\ H_2O$ 120.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
HCl (0.05 M) 1000.0 ml
pH 7.0-7.2
Solution 1 is boiled before sterilization for a few minutes being flushed with gas mixture of 80% N_2 and 20% CO_2 with sodium bicarbonate added until an equilibrium pH of 6.9 - 7.1. Solution 1 is autoclaved under this gas mixture at 121°C for 15 min. Solution 2 is autoclaved under 100% N_2 at 121°C for 15 min. Vitamin solution and Na-pyruvate is filter sterilized.

237. *DESULFUROCOCCUS FERMENTANS* MEDIUM
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.44 g
$MgCl_2 \times 6\ H_2O$ 0.7 g
NaCl 0.5 g
Trace elements *SL-10* (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
Yeast extract 0.2 g
Starch 5.0 g
Resazurin 1.0 mg
$NaHCO_3$ 0.8 g
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:

Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except vitamins, bicarbonate and sulfide), boil medium for 1 min, then cool to room temperature under 80% N_2 and 20% CO_2 gas atmosphere. Adjust pH to 6.2-6.4 and autoclave at 121°C 15 min. After autoclaving add vitamins from an anoxic stock solution sterilized by filtration and bicarbonate from a sterile stock solution prepared under 80% N_2 and 20% CO_2 gas mixture (autoclave at 121°C 15 min). Prior to inoculation reduce medium by adding sulfide from a sterile, anoxic stock solution prepared under N_2 (autoclave at 121°C 15 min).

238. *AQUASPIRILLUM* MEDIUM II
$(NH_4)_2SO_4$ 1.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$CaCl_2 \times 2\ H_2O$ 30.0 mg
Na_2HPO_4 10.0 mg
Casamino acids 1.5 g
Sodium succinate (10% solution) 10.0 ml
$Na_2S_2O_3 \times 5\ H_2O$ (10% solution) 1.0 ml
Vitamin solution (see below) 5.0 ml
Trace element solution *SL-10* (see below) 1.0 ml
Vitamin solution:
Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
p-Aminobenzoic acid 50.0 mg
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Agar 0.5 g
Distilled water 985.0 ml
pH 7.5

Basal medium, trace element solution autoclave separately at 121°C 15 min. Vitamin solution sterilize by filtration.

239. *METHYLOPHAGA ALCALICA* MEDIUM
KH_2PO_4 1.0 g
KNO_3 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.22 g
NaCl 30.0 g
Na_2CO_3 5.0 g
Trace element solution (see below) 1.0 ml
Vitamin B_{12} 0.02 mg
Methanol 10.0 ml
Distilled water 1000.0 ml
Final pH 9.5
Trace elements solution:
Ferric citrate 30.0 mg
$CaCl_2 \times 2\ H_2O$ 30.0 mg
$MgCl_2 \times 4\ H_2O$ 5.0 mg
$ZnSO_4 \times 7\ H_2O$ 5.0 mg
$CuSO_4 \times 5\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Prepare the medium without the Na_2CO_3, vitamin B_{12} and methanol. Basal medium, trace element and Na_2CO_3 autoclave separately at 121°C 15 min. Add the vitamin B_{12} solution from a filter-sterilized stock solution and filter-sterilized methanol to the cooled medium. When preparing liquid media cool the mineral salts solution and Na_2CO_3 to room temperature before mixing. When preparing agar add 2.0 % agar to the mineral salt solution and autoclave. Cool the Na_2CO_3 stock solution and agar to 50-55°C before mixing.

240. *METHYLOTHERMUS THERMALIS* MEDIUM
KNO_3 0.25 g
NH_4Cl 0.25 g
KH_2PO_4 0.13 g
$Na_2HPO_4 \times 12\ H_2O$ 0.358 g
$MgSO_4 \times 7\ H_2O$ 0.4 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
Agar 20.0 g
Distilled water 1000.0 ml
pH 6.8
The gas phase methane/air mixture (4:1)
Autoclave at 121°C 15 min.

241. *OCEANITHERMUS PROFUNDUS* MEDIUM
NH_4Cl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
KCl 0.33 g
KNO_3 0.33 g
NaCl 30.0 g
HEPES 2.38 g
Yeast extract 0.2 g
Tryptone 1.0 g
Sucrose 2.0 g
Vitamin solution (see below) 1.0 ml
Trace elements (see below) 1.0 ml

Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 mg
$FeSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$CoCl_2 \times 2\ H_2O$ 0.17 mg
$CaCl_2 \times 2\ H_2O$ 0.1 mg
$ZnCl_2$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
H_3BO_3 0.01 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.01 mg
NaCl 1.0 mg
Na_2SeO_4 0.017 mg
Distilled water 1000.0 ml
Prepare the medium anaerobically, under N_2, omitting the $CaCl_2 \times 2\ H_2O$, $MgCl_2 \times 6\ H_2O$, KNO_3, tryptone, yeast extract, vitamins and sucrose. The pH should be 7.0-7.5. Dispense the medium into vessels suitable for anaerobic growth (Hungate tubes or serum bottles) under an atmosphere of N_2 and autoclave at 121°C 15 min. To the sterile, cooled medium add, from sterile stock solutions the $CaCl_2 \times 2\ H_2O$, $MgCl_2 \times 6\ H_2O$, KNO_3, tryptone, yeast extract, vitamins and sucrose. The $CaCl_2 \times 2\ H_2O$, $MgCl_2 \times 6\ H_2O$, KNO_3, tryptone, and yeast extract, stock solutions should be autoclaved at 121°C 15 min, sucrose at 111° 30 min, while the vitamin solution is sterile filtered.

242. *PSYCHROBACTER* MEDIUM
Peptone 5.0 g
Yeast extract 1.0 g
Sea salts 17.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 121°C 15 min.

243. *ROSEICYCLUS* MEDIUM
KH_2PO_4 0.3 g
$MgSO_4 \times 7\ H_2O$ 2.0 g
NH_4Cl 0.3 g
KCl 0.3 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Na_2SO_4 15.0 g
$NaHCO_3$ 0.5 g
Na-acetate $\times 3\ H_2O$ 1.0 g
Na-malate 1.0 g
Yeast extract 1.0 g
Peptone 0.5 g

Agar 20.0 g
Distilled water 1000.0 ml
pH 7.8-8.0
Autoclave at 121°C 15 min.

244. *SULFOBACILLUS* MEDIUM
Solution A:
$(NH_4)_2SO_4$ 3.0 g
KCl 0.1 g
K_2HPO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$Ca(NO_3)_2$ 0.01 g
Distilled water 680.0 ml
pH 2.0-2.2 (adjust with sulfuric acid)
Solution B:
$FeSO_4 \times 7\ H_2O$ 44.2 g
Distilled water 300.0 ml
H_2SO_4 (10 N) 1.0 ml
Solution C:
Yeast extract (1% w/v in water) 20.0 ml
pH 1.9-2.4
After autoclaving at 121°C 15 min, combine the three solutions.

245. *THERMINCOLA* MEDIUM
NH_4Cl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
KCl 0.33 g
KH_2PO_4 0.5 g
Resazurin 0.5 mg
Wolfe's mineral elixir (see below) 1.0 ml
Vitamin solution (see below) 20.0 ml
$NaHCO_3$ 0.5 g
Na_2CO_3 0.5 g
Na-acetate $\times 3\ H_2O$ 0.2 g
Yeast extract 0.2 g
$Na_2S \times 9\ H_2O$ 1.0 g
Distilled water 1000.0 ml
Wolfe's mineral elixir:
$MgSO_4 \times 7\ H_2O$ 30.0 g
$MnSO_4 \times H_2O$ 5.0 g
NaCl 10.0 g
$FeSO_4 \times 7\ H_2O$ 1.0 g
$CoCl_2 \times 6\ H_2O$ 1.8 g
$CaCl_2 \times 2\ H_2O$ 1.0 g
$ZnSO_4 \times 7\ H_2O$ 1.8 g
$CuSO_4 \times 5\ H_2O$ 0.1 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.18 g
H_3BO_3 0.1 g
$Na_2MoO_4 \times 2\ H_2O$ 0.1 g
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 2.8 g
$Na_2WO_4 \times 2\ H_2O$ 0.1 g
Na_2SeO_4 0.1 g
Distilled water 1000.0 ml

First adjust pH to 1.0 with diluted H_2SO_4, then add and dissolve the salts.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except carbonates, vitamin solution, yeast extract and sulfide, boil medium for 1 min, then cool to room temperature under N_2 gas atmosphere. Add carbonates and sulfide to the medium, dispense under CO gas atmosphere in culture vessels (e.g., 10.0 ml medium in 50 ml serum bottles) and autoclave at 121°C 15 min. Prior to inoculation add yeast extract from a sterile, anoxic stock solution prepared under N_2 and adjust pH of final medium to 8.0 with a sterile, anoxic solution of 1 N HCl (this solutions autoclave at 121°C 15 min). Add filter-sterilized vitamin solution.

246. *VULCANITHERMUS* MEDIUM
NH_4Cl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
KCl 0.33 g
KNO_3 0.33 g
NaCl 25.0 g
PIPES 3.6 g
Yeast extract 0.5 g
Tryptone 1.0 g
Sucrose 1.0 g
Vitamin solution (see below) 1.0 ml
Trace elements solution (see below) 1.0 ml
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 mg
$FeSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$CoCl_2 \times 2\ H_2O$ 0.17 mg
$CaCl_2 \times 2\ H_2O$ 0.1 mg
$ZnCl_2$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg

H_3BO_3 0.01 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.01 mg
NaCl 1.0 mg
Na_2SeO_4 0.017 mg
Distilled water 1000.0 ml
pH 6.8
Prepare the medium anaerobically, under N_2, omitting the $CaCl_2 \times 2\ H_2O$, $MgCl_2 \times 6\ H_2O$, KNO_3, tryptone, yeast extract, vitamins and sucrose. Dispense the medium into vessels suitable for anaerobic growth (Hungate tubes or serum bottles) under an atmosphere of N_2 and autoclave at 121°C 15 min. To the sterile, cooled medium add, from sterile stock solutions the $CaCl_2 \times 2\ H_2O$, $MgCl_2 \times 6\ H_2O$, KNO_3, tryptone, yeast extract, vitamins and sucrose. The $CaCl_2 \times 2\ H_2O$, $MgCl_2 \times 6\ H_2O$, KNO_3, tryptone, and yeast extract, stock solutions should be autoclaved at 121°C 15 min, sucrose at 111°C 30 min, while the vitamin solution is sterile filtered.

247. *RHODOBLASTUS* MEDIUM
Yeast extract 0.1 g
Na_2-succinate 1.0 g
KH_2PO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.4 g
NaCl 0.4 g
NH_4Cl 0.4 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Trace element solution *SL-6* (see below) 1.0 ml
Methanol 0.01-1%
Distilled water 1000.0 ml
pH 5.7
Trace element solution SL-6:
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Autoclave basal medium and trace element solution separately at 121°C 15 min, methanol sterilize by filtration.

248. PFENNIG'S MEDIUM
KH_2PO_4 0.34 g
NH_4Cl 0.34 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
KCl 0.34 g
Trace element solution *SLA* (see below) 1.0 ml
Vitamin B_{12} 20 µg
$NaHCO_3$ 1.5 g
$Na_2S \times 9\ H_2O$ 0.4 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.5 g
NaCl 15.0 g
$MgCl_2 \times 6\ H_2O$ 2.5 g
pH 7.5
Trace element solution SLA:
$FeCl_2 \times 4\ H_2O$ 1.8 mg

$CoCl_2 \times 6\ H_2O$ 250 mg
$NiCl_2 \times 6\ H_2O$ 10 mg
$CuCl_2 \times 2\ H_2O$ 10 mg
$MnCl_2 \times 4\ H_2O$ 70 mg
$ZnCl_2$ 100 mg
H_3BO_3 500 mg
$Na_2MoO_4 \times 2\ H_2O$ 30 mg
$Na_2SeO_3 \times 5\ H_2O$ 10 mg
Distilled water 1000.0 ml
Autoclave basal medium and trace element solution separately at 121°C 15 min, vitamin B_{12} sterilize by filtration.

249. *METHYLOPHAGA MURALIS* MEDIUM
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g
NaCl 30.0 g
$FeSO_4 \times 7\ H_2O$ 0.0 2 g
Methanol 5.0 ml
Vitamin B_{12} 20.0 μg
Distilled water 1000.0 ml
pH 8.0
Autoclave at 121°C for 15 min. Methanol and vitamin B_{12} added from stock solution (sterilized by filtration) after autoclaving.

250. MODIFIED MEDIUM FOR MARINE METHYLOTROPHIC BACTERIA WITH YEAST EXTRACT AND BIOTIN
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g
$FeSO_4 \times 7\ H_2O$ 0.02 g
Yeast extract 0.1 g
Methanol 10.0 ml
Biotin 0.01 mg
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C 15 min, methanol and biotin sterilize by filtration.

251. *CHELATIVORANS OLIGOTROPHICUS* MEDIUM
Na_4EDTA 1.0 g
$Na_2HPO_4 \times 12\ H_2O$ 4.0 g
KH_2PO_4 0.26 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.4 g
Trace element solution (see below) 2.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
pH 7.0
Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.5 g
H_3BO_3 60.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
$CoCl_2 \times 6\ H_2O$ 120.0 mg
$ZnCl_2$ 70.0 mg

$NiCl_2 \times 6\ H_2O$ 25.0 mg
$CuCl_2 \times 2\ H_2O$ 15.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 25.0 mg
HCl, 0.05 molar 1000.0 ml
Vitamin solution:
Pyridoxine-HCl 100.0 mg
Thiamine-HCl $\times 2\ H_2O$ 50.0 mg
Riboflavin 50.0 mg
Nicotinic acid 50.0 mg
Pantothenic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Lipoic acid 50.0 mg
Nicotine amide 50.0 mg
Vitamin B_{12} 50.0 μg
Biotin 20.0 mg
Folic acid 20.0 mg
Distilled water 1000.0 ml
Autoclave at 121°C 15 min, vitamin solution stir for some hours and sterilize by filtration.

252. MODIFIED METHYLOTROPH MEDIUM 1 WITH KCNS
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g
NaCl 0.5 g
KCNS 0.24 g
$FeSO_4 \times 7\ H_2O$ 0.0 2 g
Methanol 5.0 ml or
Methylamine 3.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C 15 min, methanol and methylamine sterilize by filtration.

253. MODIFIED MEDIUM FOR METHANOTROPHIC BACTERIA WITH ETHANOL
KNO_3 1.0 g
KH_2PO_4 0.7 g
$MgSO_4 \times 7\ H_2O$ 0.2g
$CaCl_2 \times 2\ H_2O$ 0.02 g
$Na_2HPO_4 \times 2\ H_2O$ 1.5 g
Trylon B 5.0 mg
$FeSO_4 \times 7\ H_2O$ 2.0 mg
$ZnSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.03 mg
$CoCl_2 \times 6\ H_2O$ 0.2 mg
$CuCl_2 \times 2\ H_2O$ 0.1 mg
$NiCl_2 \times 6\ H_2O$ 0.02 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.03 mg
Ethanol 5.0 ml
Distilled water 1000.0 ml
pH 6.7 - 7.1
Autoclave at 121°C 15 min, ethanol sterilize by filtration.
Cultivation under mixture of methane and air (1:1).

254. MODIFICATION OF TWEEN-80 MEDIUM FOR MILK-ACID BACTERIA (10% NaCl)
Beef extract 1.2 g

Yeast extract 5.0 g
Glucose 2.5 g
Tween-80 1.0 ml
K_2HPO_4 2.0 g
Na-acetate × 3 H_2O 5.0 g
NaCl 60.0 g
NH_4-citrate 2.0 g
$MgSO_4$ × 7 H_2O 0.2 g
$MnSO_4$ × 4 H_2O 0.05 g
Agar 5.0 g
Distilled water 1000.0 ml
pH 6.0-6.5
Autoclave at 111°C for 30 min.

255. MINERAL MEDIUM FOR *METHYLOMICROBIUM KENYENSE*
Na_2CO_3 2.3 g
$NaHCO_3$ 7.0 g
K_2HPO_4 × 12 H_2O 0.5 g
KNO_3 0.5 g
$MgSO_4$ × 7 H_2O 0.4 g
NaCl 5.0 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace elements solution:
EDTA 5.0 g
$CuCl_2$ × 2 H_2O 0.1 g
$FeSO_4$ × 7 H_2O 2.0 g
$ZnSO_4$ × 7 H_2O 0.1 g
$NiCl_2$ × 6 H_2O 0.02 g
$CoCl_2$ × 6 H_2O 0.2 g
Na_2MoO_4 × 2 H_2O 0.03 g
Distilled water 1000.0 ml
Prepare the medium without $NaHCO_3$ and Na_2CO_3. Basal medium, trace element solution, $NaHCO_3$ and Na_2CO_3 autoclave at 121°C 15 min. When preparing liquid media cool the mineral salts solution, $NaHCO_3$ and Na_2CO_3 to room temperature before mixing. For solid medium add 2.0 % agar to the mineral salt solution and autoclave. Cool the $NaHCO_3$ and Na_2CO_3 stock solution and agar to 50-55°C before mixing.
The pH of the complete medium should be at 10.0.

256. MODIFIED METHYLOTROPH MEDIUM 1 WITH YEAST AUTOLYZATE
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4$ × 7 H_2O 0.025 g
NaCl 0.5 g
$FeSO_4$ × 7 H_2O 0.0 2 g
Methanol 5.0 ml or Methylamine 3.0 g
Yeast autolizate 1.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C 15 min, methanol and methylamine sterilize by filtration.

257. MODIFIED STARCH AMMONIA AGAR (10% NaCl)
Starch (soluble) 10.0 g
K_2HPO_4 1.0 g

$MgSO_4 \times 7\ H_2O$ 1.0g
NaCl 100.0 g
$(NH_4)_2SO_4$ 2.0 g
$CaCO_3$ 2.0 g
Salt solution (see below) 1.0 ml
Agar 20.0 g
Distilled water 1000.0 ml
Salt solution:
$FeSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 100.0 ml
pH 7.0-7.4
Autoclave separately at 121°C 15 min.

258. *NOCARDIOIDES AQUATICUS* MEDIUM
Base medium (see below) 600.0 ml
Artificial sea water (see below) 400.0 ml
pH 7.5
Base medium:
Peptone Bacto 0.25 g
Yeast extract Bacto 0.25 g
Glucose solution (2.5%) 10.0 ml
Staley's vitamin solution, double concentration (see below) 5.0 ml
Hutner's basal salts medium (see below) 20.0 ml
Agar Bacto 15.0 g
Distilled water 965.0 ml
Artificial sea water (AWS):
NaCl 23.477 g
Na_2SO_4 3.917 g
$MgCl_2 \times 6\ H_2O$ 4.981 g
$CaCl_2 \times 2\ H_2O$ 1.1 g
$NaHCO_3$ 192.0 mg
KCl 664.0 mg
KBr 6.0 mg
H_3BO_3 26.0 mg
$SrCl_2$ 24.0 g
NaF 3.0 mg
Distilled water 1000.0 ml
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 12.67 mg
$FeSO_4 \times 7\ H_2O$ 99.0 mg
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water.
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg

$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Staley´s vitamin solution, double concentration:
Biotin 4.0 mg
Folic acid 4.0 mg
Pyridoxine-HCl 20.0 mg
Riboflavin 10.0 mg
Thiamine-HCl × 2 H2O 10.0 mg
Nicotinamide 10.0 mg
D-Ca-pantothenate 10.0 mg
Vitamin B_{12} 0.2 mg
p-Aminobenzoic acid 10.0 mg
Distilled water 1000.0 ml
Autoclave Base medium (except glucose solution and vitamin solution) and Artificial sea water separately at 121°C 15 min. After cooling to 60°C aseptically add to the Base medium glucose solution (sterilize by filtration) and vitamin solution (sterilize by filtration). Store vitamin solution in the dark and cold (5°C). Add 600.0 ml Base medium to 400 ml Artificial sea water and mix thoroughly.

259. ISP-2 MEDIUM WITH 5% NaCl
Yeast extract 4.0 g
Malt extract 10.0 g
Glucose (D-glucose) 4.0 g
Agar 15.0-20.0 g
NaCl 50.0 g
Distilled water 1000.0 ml
pH 7.2
Autoclave at 111°C for 30 min.

260. V-8 MEDIUM
Commercial V8 vegetable juice 175.0 ml
$CaCO_3$ 3.0 g
Agar 20.0 g
Distilled water to 1000.0 ml
pH 6.4
Autoclave at 111°C for 30 min.

261. *ROSEINATRONOBACTER MONICUS* MEDIUM
NH_4Cl 0.4 g
KH_2PO_4 0.5 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
Na_2SO_4 0.5 g
$NaNO_3$ 0.4 g
NaCl 40.0 g
KCl 0.5 g
$NaHCO_3$ 10.0 g
Na_2CO_3 5.0 g
$Na_2S_2O_3 \times 5\ H_2O$ 1.0 g
Vitamin B_{12} 10.0 µg
Sodium pyruvate 1.0 g

Sodium acetate 1.0 g
Peptone 1.0 g
Yeast extract 1.0 g
Trace element solution *SL-10* 1.0 ml
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
The trace element solution preparation: $FeCl_2 \times 4\ H_2O$ is dissolved firstly in HCl, and then is mixed with water and other salts are dissolved in the sequence indicated.
Autoclave the medium, trace element solution, $NaHCO_3$ and Na_2CO_3 separately at 121°C for 15 min and add to the medium. Add the vitamin B_{12} solution from a filter-sterilized stock solution to the autoclaved, cooled medium.
Final pH 9.0 - 9.5

262. MINERAL MEDIUM
KNO_3 250.0 mg
KH_2PO_4 100.0 mg
$MgSO_4 \times 7\ H_2O$ 50.0 mg
$CaCl_2 \times 2\ H_2O$ 10.0 mg
Trace elements solution 1.0 ml
Distilled water 1000.0 ml
Trace elements solution:
EDTA 5.0 g
$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min.
Final pH 5.5-6.0

263. *SINGULISPHAERA* MEDIUM
N-acetylglucosamine 1.0 g
KH_2PO_4 0.1 g
Hutner's basal salts medium 20.0 ml
Peptone 0.1 g
Yeast extract 0.1 g
Agar-agar (Difco) 18.0 g
Distilled water 1000.0 ml
Adjust pH to 5.8
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g

$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 12.67 mg
$FeSO_4 \times 7\ H_2O$ 99.0 mg
Metal salt solution “44” (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water.
Metal solution “44”:
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Autoclave at 121°C 15 min.

264. *ROSEOCOCCUS SUDUNTUYENSIS* MEDIUM
NH_4Cl 0.4 g
KH_2PO_4 0.5 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
Na_2SO_4 0.5 g
NaCl 2.0 g
KCl 0.5 g
$NaHCO_3$ 5.0 g
Na_2CO_3 0.5 g
$Na_2S_2O_3 \times 5\ H_2O$ 1.0 g
Vitamin B_{12} 10.0 μg
Na-pyruvate 1.0 g
Na-acetate $\times 3\ H_2O$ 1.0 g
Peptone 1.0 g
Yeast extract 1.0 g
Trace element solution *SL-10* (see below) 1.0 ml
Final pH 8.5
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
The trace element solution preparation: $FeCl_2 \times 4\ H_2O$ is dissolved firstly in HCl, and then is mixed with water and other salts are dissolved in the sequence indicated.

Autoclave the medium, trace element solution, $NaHCO_3$ and Na_2CO_3 separately at 121°C for 15 min and add to the medium. Add the vitamin B_{12} solution from a filter sterilized stock solution to the cooled medium.

265. *ECTOTHIORHODOSPIRA VARIABILIS* MEDIUM

NaCl 50.0 g
Na_2CO_3 5.0 g
$NaHCO_3$ 15.0 g
KCl 0.1 g
K_2HPO_4 0.5 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
NH_4Cl 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.5 g
Yeast extract 0.1 g
Na-acetate $\times 3\ H_2O$ 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Vitamin B_{12} 20.0 µg
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
The trace element solution preparation: $FeCl_2 \times 4\ H_2O$ is dissolved firstly in HCl, and then is mixed with water and other salts are dissolved in the sequence indicated.
Prepare and boil the medium in the absence of $Na_2S \times 9\ H_2O$, $NaHCO_3$, vitamin B_{12}, $MgCl_2 \times 6\ H_2O$. Cool under a stream of nitrogen and add the remaining components, except vitamin B_{12} and $Na_2S_2O_3 \times 5\ H_2O$. Dispense into tubes or bottle fitted with rubber stoppers and autoclave. Add the vitamin B_{12} (filter sterilized) and $Na_2S_2O_3 \times 5\ H_2O$ from sterile stock solutions.
Autoclave at 121°C for 15 min.
Final pH 9.0 – 9.5

266. *ACIDISOMA* MEDIUM

KH_2PO_4 0.1 g
$(NH_4)_2SO_4$ 0.25 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
$MgSO_4 \times 7\ H_2O$ 0.02 g
Trace elements solution (see below) 1.0 ml
Yeast extract 0.1 g
Na gluconate 0.5 g
Distilled water 1000.0 ml
Trace element solution s:
EDTA 5.0 g
$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g

$CoCl_2 \times 6\ H_2O$ 0.2 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Autoclave the base medium and trace element solution separately at 121°C for 15 min. Adjust to pH 5.0 – 5.5.

267. *GRANULICELLA* MEDIUM
Glucose 0.5 g
Yeast extract 0.1 g
Casamino acids 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.04 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
Distilled water 1000.0 ml
The medium may be solidified with 15 g/l agar.
Final pH 4.5 – 5.2
Autoclave at 121°C for 15 min.

268. *ZAVARZINELLA FORMOSA* MEDIUM
KH_2PO_4 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$CaCl_2 \times 6\ H_2O$ 0.05 g
NaCl 0.01 g
N-acetylglucosamine 1.0 g
Glucose 0.5 g
Peptone 0.1 g
Yeast extract 0.1 g
Casamino acids 0.1 g
"Metals 44" 1.0 ml
Agar (for solid medium) 15.0 g
Distilled water 1000.0 ml
Final pH 5.8 – 6.0
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Autoclave the medium and trace element solution separately at 121°C for 15 min.

269. *THIOTHRIX* MEDIUM
NH_4Cl 0.2 g
K_2HPO_4 10.0 mg
$MgSO_4 \times 7\ H_2O$ 10.0 mg
$CaSO_4$ (saturated solution) 20.0 ml
Trace element solution (see below) 5.0 ml
Na-acetate $\times 3\ H_2O$ 0.1 g
Agar (if necessary) 12.0 g
$Na_2S \times 9\ H_2O$ 10% (w/v) solution 3.0 ml
Distilled water 1000.0 ml

Adjust pH to 7.5 before autoclaving.
Trace element solution:
EDTA 0.2 g
$FeSO_4 \times 7\ H_2O$ 0.7 g
$ZnSO_4 \times 7\ H_2O$ 0.01 g
$MnSO_4 \times 4\ H_2O$ 0.0 2 g
$CuSO_4 \times 5\ H_2O$ 5.0 µg
H_3BO_3 10.0 mg
$Co(NO_3)_2$ 1.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 1.0 mg
Distilled water 1000.0 ml
Basal medium and $Na_2S \times 9\ H_2O$ solution autoclave separately at 121°C 15 min.

270. TRYPTICASE SOY BROTH AGAR
Trypticase Soy Broth (BBL 11768, Oxoid CM129 or Merck 5459) 30.0 g or
Pancreatic digest of casein 18.0 g
Papaic digest of soybean 6.0 g
NaCl 6.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.3
Autoclave at 121°C for 15 min.

271. MARINE SPIROCHETE MEDIUM
Tryptone 2.0 g
Yeast extract 1.0 g
Na-Thioglycolate 1.0 g
Resazurin 0.5 mg
Charcoal-filtered, natural seawater 800.0 ml
Distilled water 200.0 ml
Dissolve ingredients (except thioglycolate), boil medium for 3 min, then cool to room temperature under N_2 gas atmosphere. Add thioglycolate and adjust pH of medium to 7.5 with 10 N KOH. Dispense under N_2 gas atmosphere in culture vessels and autoclave at 121°C for 15 min. Prepare 10% cellobiose solution (10.0 g in 100.0 ml distilled water) under nitrogen atmosphere, filter-sterilize and add 0.2 ml to 10.0 ml autoclaved medium.

272. *ECTOTHIORHODOSPIRA MAGNA* MEDIUM
KH_2PO_4 0.5 g
NaCl 30.0 g
NH_4Cl 0.5 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
Na-acetate $\times 3\ H_2O$ 1.0 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
$NaHCO_3$ 5.0 g
Na_2CO_3 5.0 g
Yeast extract 0.1 g
Vitamin B_{12} 10.0 µg
Trace elements solution (see below) 1.0 ml
Distilled water 1000.0 ml
pH 9.0-9.5
Trace elements solution:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.2 g

$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
$H_3BO_3$0.03 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.03 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
pH 3.0-4.0
Prepare the medium without the $NaHCO_3$, $Na_2S \times 9\ H_2O$, Na_2CO_3 and vitamin B_{12}, under a nitrogen atmosphere.
Autoclave at 121°C for 15 min and add the vitamin B_{12} from a filter-sterilized stock solution and the $NaHCO_3$ (autoclaved in sealed, half full vessels), $Na_2S \times 9\ H_2O$, Na_2CO_3 from autoclaved at 121°C for 15 min stock solutions. The final pH of the medium should be 9.0-9.5.

273. *LAMPROBACTER MODESTOHALOPHILUS* MEDIUM
KH_2PO_4 0.5 g
NaCl 40.0 g
NH_4Cl 0.5 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
Na-acetate $\times 3\ H_2O$ 0.5 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
$NaHCO_3$ 1.5 g
Yeast extract 0.1 g
Vitamin B_{12} 20.0 µg
Trace elements solution (see below) 1.0 ml
Distilled water 1000.0 ml
pH 7.5
Trace elements solution:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.2 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.03 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.03 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
pH 3.0-4.0
Prepare the medium without the $NaHCO_3$, $Na_2S \times 9\ H_2O$, Na_2CO_3 and vitamin B_{12}, under a nitrogen atmosphere. Autoclave at 121°C for 15 min and add the vitamin B_{12} from a filter-sterilized stock solution and the $NaHCO_3$ (autoclaved in sealed, half full vessels), $Na_2S \times 9\ H_2O$, Na_2CO_3 from autoclaved at 121°C for 15 min stock solutions. The final pH of the medium should be 9.0-9.5.

274. *GRANULICELLA PALUDICOLA* MEDIUM
Fructose 0.5 g
Yeast extract 0.05 g
Casamino acids 0.05 g
$MgSO_4 \times 7\ H_2O$ 0.04 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
KH_2PO_4 0.1 g
$(NH_4)_2SO_4$ 0.1 g

Distilled water 1000.0 ml
The medium may be solidified with 15 g/l agar. Adjust to pH 4.0 – 5.0 with alginic acid. Autoclave at 121°C for 15 min.

275. *TELMATOCOLA* MEDIUM
Mineral salts solution:
KH_2PO_4 0.1 g
$(NH_4)_2SO_4$ 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
Hutner's basal salts medium 1.0 ml
Staley´s vitamin solution 1.0 ml
Yeast extract 0.1 g
Glucose (1% v/v) 10.0 ml
Distilled water 1000.0 ml
Trace elements solution 44:
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.335 g
$(NH_4)_6MoO_7O_{24} \times 4\ H_2O$ 9.25 mg
$FeSO_4 \times 7\ H_2O$ 99.0 mg
"Metals 44" 50.0 ml
Distilled water 950.0 ml
Dissolve the nitrilotriacetic acid, adjust the pH to 7.0 with KOH (about 7.3 g). Dissolve other salts separately, combine and adjust the pH to 6.8.
"Metals 44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.2 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve the EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of the heavy metal ions.
Staley´s vitamin solution:
Vitamin B_{12} 0.1 mg
Biotin 2.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Ca-pantothenate 5.0 mg
Folic acid 2.0 mg
Riboflavin 5.0 mg
Nicotinamide 5.0 mg
p-Aminobenzoic acid 5.0 mg
Pyridoxine hydrochloride 10.0 mg
Distilled water 1000.0 ml
Prepare the liquid medium. Adjust to pH 4.8 - 5.5. Dispense the medium into serum bottles under gassing with CO_2 (5% v/v). Autoclave at 121°C for 15 min. Before inoculation add from filter-sterilized *Staley´s* vitamin solution and autoclaving at 121°C for 15 min glucose.

276. *PROTEINIVORAX* MEDIUM
KH_2PO_4 0.3 g

$MgSO_4 \times 7\ H_2O$ 0.12 g
$CaCl_2 \times 2\ H_2O$ 30.0 mg
NaCl 20.0 g
Tryptone 3.0 g
Trace element solution *SL-10* 1.0 ml
Na_2CO_3 60.0 g
$NaHCO_3$ 50.0 g
Na-Thioglycolate 1.0 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
The trace element solution preparation: $FeCl_2 \times 4\ H_2O$ is dissolved firstly in HCl, and then is mixed with water and other salts are dissolved in the sequence indicated.
Dissolve ingredients (except carbonates and thioglycolate), boil medium for 1 min, then cool to room temperature under N_2 gas atmosphere. Add carbonates and adjust pH to 8.5 – 9.0. Dispense under same gas atmosphere in culture vessels and autoclave. After autoclaving at 121°C for 15 min add thioglycolate from a sterile anoxic stock solution sterilized by filtration.

277. MS1 MEDIUM
NH_4Cl 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
K_2SO_4 0.5 g
$FeSO_4 \times 7\ H_2O$ 2.5 mg
$CaCl_2 \times 2\ H_2O$ 10.0 mg
$CuSO_4 \times 5\ H_2O$ 2.0 mg
H_3BO_3 0.06 mg
$ZnCl_2$ 20.0 mg
$MnSO_4 \times H_2O$ 1.0 mg
$NiCl_2 \times 6\ H_2O$ 0.05 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.3 mg
Na-glutamate 10.0 g
Distilled water 1000.0 ml
pH 7.0-7.5
Autoclave at 121°C for 15 min.

278. MODIFIED S MEDIUM
KH_2PO_4 0.14 g
$MgSO_4 \times 7\ H_2O$ 0.4 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
NH_4Cl 0.25 g
KCl 0.36 g
NaCl 6.0
Yeast extract 0.1 g
Trace elements solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml

Distilled water 1000.0 ml
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (Mohr's salt) 784.0 mg
HCl (concentrated) 5.0 ml
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
HBO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Distilled water 995.0 ml
Mohr's salt is dissolved firstly in concentrated HCl, then is mixed with water and other salts are dissolved in the sequence indicated.
Vitamin solution:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 100.0 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
Autoclave at 121°C 15 min. Add filter-sterilized vitamin solution and trace elements from sterile stock solution.

279. M3 MEDIUM
KH_2PO_4 0.1 g
NH_4Cl 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
Yeast extract 0.1 g
Glucose (or malate) 0.5 g
Trace element solution *'SLA'* (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution SLA:
$FeCl_2 \times 4\ H_2O$ 1.8 mg
$CoCl_2 \times 6\ H_2O$ 250.0 mg
$NiCl_2 \times 6\ H_2O$ 10.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$MnCl_2 \times 4\ H_2O$ 70.0 mg
$ZnCl_2$ 100.0 mg
H_3BO_3 500.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 30.0 mg
$Na_2SeO_3 \times 5\ H_2O$ 10.0 mg
Distilled water 1000.0 ml
Autoclave basal medium and trace element solution separately at 121°C 15 min.
pH 5.8-6.0

280. *PLANCTOMYCES* MEDIUM
KH_2PO_4 0.1 g
$(NH_4)_2SO_4$ 0.2 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
$CaCl_2 \times 6\ H_2O$ 0.02 g
NaCl 0.01 g
N-acetylglucosamine 1.0 g
Glucose 0.5 g
Yeast extract 0.2 g
Hutner's basal salts (see below) 1.0 ml
Staley's vitamin solution (see below) 1.0 ml
Phytagel (for solid medium) 8.0 g
Distilled water 1000.0 ml
Adjust pH to 5.8-6.5
Hutner's basal salts
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 12.67 mg
$FeSO_4 \times 7\ H_2O$ 99.0 mg
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water.
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Staley's vitamin solution:
Vitamin B_{12} 0.1 mg
Biotin 2.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Ca-pantothenate 5.0 mg
Folic acid 2.0 mg
Riboflavin 5.0 mg
Nicotinamide 5.0 mg
p-Aminobenzoic acid 5.0 mg
Pyridoxine-HCl 10.0 mg
Distilled water 1000.0 ml
Store in the dark and cold (5°C).
Autoclave at 121°C 15 min. Add filter-sterilized vitamin solution.

281. *AZOSPIRILLUM AMAZONENSE* MEDIUM
K_2HPO_4 0.2 g
KH_2PO_4 0.6 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
$MgSO_4 \times 7\ H_2O$ 0.2 g

$Na_2MoO_4 \times 2\ H_2O$ 0.0 2 g
$FeCl_2 \times 4\ H_2O$ 0.01 g
Bromothymol blue (0.5% in 0.2N KOH) 5.0 ml
Sucrose 5.0 g
Distilled water 1000.0 ml
Adjust pH to 6.0
For semisolid medium, add 0.5 g of agar; for solid medium, add 15 g of agar.
Autoclave at 111°C for 30 min.

282. *AZOSPIRILLUM HALOPRAEFERENS* MEDIUM
Beef extract 1.0 g
Yeast extract 2.0 g
Peptone 5.0 g
NaCl 5.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.4
Autoclave at 121°C 15 min.

283. *AZOSPIRILLUM* VM MEDIUM
Döbereiner's basic 10.0 ml
Fe_3 EDTA 0.66% (w/v) 10.0 ml
NH_4Cl 0.5 g
NaCl 1.0 g
Yeast extract 1.0 g
Peptone 3.0 g
Phosphate buffer pH 6.8 3.0 ml
Agar 15.0 g
Distilled water 1000.0 ml
Döbereiner's basic:
$MgSO_4$ 20.0 g
NaCl 10.0 g
$CaCl_2 \times 2\ H_2O$ 2.64 g
$Na_2MoO_4 \times 2\ H_2O$ 0.2 g
$MnSO_4 \times 2\ H_2O$ 1.0 g
Distilled water 1000.0 ml
Phosphate buffer pH 6.8:
KH_2PO_4 0.6 g
K_2HPO_4 0.4 g
Distilled water 3.0 ml
Autoclave basal medium, Fe_3EDTA solution, Döbereiner's basic and phosphate buffer separately at 121°C 15 min.

284. *METHYLOCYSTIS* MEDIUM
KNO_3 0.2 g
KH_2PO_4 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.05 g
$CaCl_2 \times 2\ H_2O$ 0.01 g
NaCl 0.01 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Final pH 5.8-6.2.
Trace element solution:
EDTA 5.0 g

$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Dispense the medium into serum bottles with a medium to headspace ratio of about 1:4. Autoclave at 121°C for 15 min. Add 20% methane to the gas phase. Incubate the cultures with shaking.

285. *TELMATOBACTER BRADUS* MEDIUM
Yeast extract 0.05 g
Proteose peptone 0.05 g
Casamino acids 0.05 g
Glucose 0.05 g
Soluble starch 0.05 g
$MgSO_4 \times 7\ H_2O$ 0.05 g
Distilled water 1000.0 ml
Adjust pH to 4.5 - 5.0 with alginic acid (or MES), fill tubes for anaerobes (Hungate) half with medium, close tightly. Autoclave at 121°C for 15 min. Do not shake.

286. *LARKINELLA ARBORICOLA* MEDIUM
KH_2PO_4 0.1 g
N-acetylglucosamine 1.0 g
Peptone 0.1 g
Yeast extract 0.1 g
Casamino acids 0.1 g
Glucose 0.5 g
Hutner's salts (see below) 20.0 ml
Distilled water 980.0 ml
Hutner's salts:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.335 g
$(NH_4)_6MoO_7O_{24} \times 4\ H_2O$ 9.25 mg
$FeSO_4 \times 7\ H_2O$ 99.0 mg
"Metals 44" 50.0 ml
Distilled water 950.0 ml
Dissolve the nitrilotriacetic acid, adjust the pH to 7.0 with KOH (about 7.3 g). Dissolve other salts separately, combine and adjust the pH to 6.8 with NaOH or H_2SO_4.
"Metals 44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.2 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve the EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of the heavy metal ions.
The medium may be solidified by adding 15 g/l agar. Final pH should be 6.0 – 6.5. Autoclave at 121°C for 15 min.

287. *METHYLOCAPSA AUREA* MEDIUM
$NaNO_3$ 200.0 mg
$MgSO_4 \times 6\ H_2O$ 200.0 mg
$CaCl_2 \times 2\ H_2O$ 40.0 mg
Fe-EDTA solution (see below) 3.0 ml
Phosphate buffer pH 5.8 100 mM (see below) 10.0 ml
Trace elements solution (see below) 1.0 ml
Distilled water 986.0 ml
Trace elements solution:
EDTA 5.0 g
$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
Fe-EDTA solution:
$FeSO_4 \times 7\ H_2O$ 1.54 g
Na_2EDTA 2.06 g
Distilled water 1000.0 ml
Phosphate buffer 100 mM:
$K_2HPO_4 \times 3\ H_2O$ 1.71 g
KH_2PO_4 12.58 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min. Final pH 5.0-5.8. 20-30% methane is added to the gas phase. The strain should be grown with shaking.

288. *ACIDICAPSA BOREALIS* MEDIUM
Yeast extract 0.05 g
Proteose peptone 0.05 g
Casamino acids 0.05 g
Glucose 0.2 g
Soluble starch 0.05 g
Na-pyruvate 0.03 g
K_2HPO_4 0.03 g
$MgSO_4 \times 7\ H_2O$ 0.05 g
Distilled water 1000.0 ml
Adjust pH to 5.0 – 5.5. Autoclave at 121°C for 15 min.

289. MEDIUM FOR *ECTOTHIORHODOSPIRA*
KH_2PO_4 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
NH_4Cl 0.8 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NaCl 30.0 g
Na_2SO_4 20.0 g
Na_2CO_3 6.0 g
Trace element solution (see below) 1.0 ml
Yeast extract 0.5 g
Na-succinate 1.0 g
$Na_2S \times 9\ H_2O$ 1.0 g
Distilled water 800.0 ml
Adjust pH to 8.5.

Trace element solution:
$FeCl_2 \times 4\ H_2O$ 1.8 g
$CoCl_2 \times 6\ H_2O$ 250.0 mg
$NiCl_2 \times 6\ H_2O$ 10.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$MnCl_2 \times 4\ H_2O$ 70.0 mg
$ZnCl_2$ 100.0 mg
H_3BO_3 500.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 30.0 mg
$Na_2SeO_3 \times 5\ H_2O$ 10.0 mg
Distilled water 1000.0 ml
For dissolving adjust pH to about 3 with 1 N HCl.
Vitamin solution:
Biotin 10.0 mg
Nicotinamide 35.0 mg
Thiamine-HCl $\times 2\ H_2O$ 30.0 mg
p-Aminobenzoic acid 20.0 mg
Pyridoxal-HCl 10.0 mg
Ca-pantothenate 10.0 mg
Vitamin B_{12} 5.0 mg
Distilled water 100.0 ml
Bicarbonate solution:
$NaHCO_3$ 14.0 g
H_2O 200.0 ml
Autoclave at 121°C for 15 minutes in screw-capped bottles. After sterilization add 1 ml/l filter-sterilized vitamin solution and 200 ml of filter-sterilized bicarbonate solution.

290. *MARINOSPIRILLUM CELERE* MEDIUM
NH_4Cl 0.5 g
KH_2PO_4 0.5 g
NaCl 25.0 g
Na_2SO_4 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
KCl 0.5 g
Yeast extract 1.0 g
Peptone 1.0 g
Lactate 1.0 g
Vitamin B_{12} 15.0 µg
Na_2CO_3 5.0 g
$NaHCO_3$ 5.0 g
Trace element solution *SL-10* (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution SL-10:
Distilled water 1000.0 ml
HCl (25%) 7.7 ml
$FeSO_4 \times 7\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO4 \times 2\ H_2O$ 36.0 mg
Autoclave the Na_2CO_3, $NaHCO_3$, lactate and the medium separately at 121°C for 15 min and combine

after cooling. Vitamin B_{12} is added from a sterilized by filtration stock solution. The final pH of the medium should be 9.5. Add 15.0 g/l agar for solid media.

291. *PROSTHECOMICROBIUM* MEDIUM
$NH_4H_2PO_4$ 0.3 g
Na_2HPO_4 0.71 g
KH_2PO_4 0.36 g
$MgSO_4 \times 7\ H_2O$ 0.3 g
Trace element solution (see below) 1.0 ml
Yeast extract 0.3 g
Glucose 0.3 g
Distilled water 1000.0 ml
Trace element solution:
Na-EDTA 0.25 g
$ZnSO_4 \times 7\ H_2O$ 1.1 g
$FeSO_4 \times 7\ H_2O$ 0.5 g
$MnSO_4 \times H_2O$ 0.154 g
$CuSO_4 \times 5\ H_2O$ 0.04 g
$Co(NO_3)_2 \times 6\ H_2O$ 0.025 g
$Na_2B_4O_7 \times 10\ H_2O$ 0.018 g
Distilled water 100.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Adjust pH to 7.0. Autoclave at 121°C for 15 min.

292. R2A AGAR MEDIUM
Bacto yeast extract 0.5 g
Proteose peptone 0.5 g
Casamino acids 0.5 g
Glucose 0.5 g
Soluble starch 0.5 g
Na-pyruvate 0.3 g
KH_2PO_4 0.3 g
$MgSO_4 \times 7\ H_2O$ 50 mg
Agar 15.0 g
Distilled water 1000.0 ml. Autoclave at 121°C for 15 min.

293. TPT 18 MEDIUM
Glucose 0.5 g
Yeast extract 0.1 g
Casitone (pancreatic digest of casein) 0.1 g
$MgSO_4 \times 7\ H_2O$ 50 mg
$CaCl_2 \times 2\ H_2O$ 20 mg
Agar (for solid medium) 14.0 g
Distilled water 1000.0 ml
Adjust to pH 6.0. Autoclave at 121°C for 15 min.

294. *METHYLOMICROBIUM JAPANENSE* MEDIUM
NH_4NO_3 0.1 g
KH_2PO_4 0.01 g
Fe(III)-EDTA 2.5 mg
Vitamin solution (see below) 10.0 ml
Trace elements solution (see below) 10.0 ml
Methanol 2.0 ml

Seawater 980.0 ml
pH 8.1
Vitamin solution
Vitamin B_{12} 0.275 mg
Biotin 0.25 mg
Thiamine-HCl 50 mg
Distilled water1000.0 ml
Trace elements solution
Na-EDTA 37.2 mg
$CuSO_4 \times 5\ H_2O$ 0.025 mg
$ZnSO_4 \times 7\ H_2O$ 0.575 mg
$MnCl_2 \times 4\ H_2O$ 0.455 mg
$CoCl_2 \times 6\ H_2O$ 0.06 mg
$(NH_4)_6Mo_7O_{24} \times 4\ H_2O$ 0.027 mg
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min, add methanol and vitamin solution sterilized by filtration.

295. *NAUTILIA* MEDIUM
Synthetic seawater (2 × conc.) (see below) 500.0 ml
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
Resazurin 0.5mg
Distilled water 400.0 ml
Synthetic seawater (2 × conc.):
NaCl 55.4 g
$SrCl_2 \times 6\ H_2O$ 0.03 g
$MgSO_4 \times 7\ H_20$ 14.0 g
KI 0.1 mg
$MgCl_2 \times 6\ H_2O$ 11.0 g
Na_3-citrate 20.0 mg
KCl 1.3 g
$CaCl_2 \times 2\ H_2O$ 1.5 g
NaBr 0.2 g
H_3BO_3 0.06 g
Distilled water 1000.0 ml
Sulfur, powdered 10.0 g
Na-formate (20% w/v) 15.0 ml
$NaHCO_3$ (5% w/v) 50.0 ml
Trace element solution (see below) 10.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ (3% w/v) 20.0
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g

$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Final pH 7.0 (with KOH).
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3.0 mg
$Na_2WO_4 \times 2\ H_2O$ 4.0 mg
Distilled water 1000.0 ml
Prepare medium anoxically under 80% N_2 + 20% CO_2 gas mixture. Vitamin solution are prepared under N_2 gas atmosphere and sterilized by filtration. Na-formate, $NaHCO_3$, trace element solution, selenite-tungstate solution and $Na_2S \times 9\ H_2O$ solution sterilize separately under 100% N_2 gas at 121°C for 15 min. Place the sulfur in screw-capped tubes or bottles and autoclave at 112°C for 15 min. Before use, aseptically layer the sulfur onto the surface of autoclaved liquid basal medium.

296. *ACIDICAPSA LIGNI* MEDIUM
KH_2PO_4 0.1 g
$MgSO_4 \times 7\ H_20$ 0.1 g
$NaNO_3$ 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
Yeast extract 0.1 g
Cellobiose 0.1 g
Distilled water 1000.0 ml
Adjust pH to 5.0 – 5.5. Autoclave at 121°C for 15 min.

297. *EDAPHOBACTER LICHENICOLA* MEDIUM
$MgSO_4 \times 7\ H_2O$ 0.8 g
KNO_3 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
Glucose 0.8 g
Yeast extract 0.1 g
Casamino acids 0.1 g
Phytagel 9.0g
Distilled water 1000.0 ml
Adjust to pH 5.0-5.6. Autoclave at 121°C for 15 min.

298. *METHYLOROSULA POLARIS* MEDIUM
Mineral salts solution:
$(NH_4)_2SO_4$ 0.05 g

$MgCl_2 \times 6\ H_2O$ 0.04 g
KH_2PO_4 0.07 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
Na_2EDTA 500.0 mg
$FeSO_4 \times 7\ H_2O$ 200.0 mg
$ZnSO_4 \times 7\ H_2O$ 10.0 mg
$MgCl_2 \times 6\ H_2O$ 3.0 mg
H_3BO_3 30.0 mg
$CoCl_2 \times 6\ H_2O$ 20.0 mg
$CaCl_2 \times 2\ H_2O$ 1.0 mg
$NiCl_2 \times 6\ H_2O$ 2.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 3.0 mg
Distilled water 1000.0 ml
Prepare the liquid medium. Adjust to pH 6.0. Dispense the medium in tubes or flasks fitted with screw caps. Autoclave at 121°C for 15 min. Before inoculation add filter sterilized CH_3OH to a final concentration of 0.5% v/v.

299. *SULFITOBACTER PONTIACUS* MEDIUM
Na-acetate 20.0 mM
HEPES 8.0 g
K_2HPO_4 1.0 g
NH_4Cl 0.5 g
Yeast extract 1.0 g
Peptone 0.5 g
NaCl 15.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Trace element solution (see below) 1.0 ml
Biotin 0.1 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Final pH 7.0 (with KOH).
Prepare the HEPES, NaCl, K_2HPO_4 and NH_4Cl as a basal salt solution, adjusting the pH to 7.5-7.8 with NaOH before sterilization. All other components are added from sterile stock solutions. Biotin solution is filter sterilized and all other solutions autoclave at 121°C for 15 min.

300. *TELMATOSPIRILLUM* MEDIUM
K_2HPO_4 0.25 g
KH_2PO_4 1.0 g
$(NH_4)_2SO_4$ 1.0 g
$CaCl_2$ 0.1 g
$MgSO_4$ 0.4 g
Na-EDTA 0.01 g
$FeCl_3 \times 6\ H_2O$ 1.0 mg
KI 0.2 mg
$CoCl_2 \times 6\ H_2O$ 0.2 mg
$MnCl_2 \times 4\ H_2O$ 0.8 mg
$ZnSO_4$ 0.8 mg
H_3BO_3 0.1 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.1 mg
$NiCl_2 \times 6\ H_2O$ 0.2 mg
Na-citrate 2.0 g
Distilled water 1000.0 ml
Prepare the medium anaerobically under nitrogen. Adjust to pH 5.5 – 6.5 with 1M H_3PO_4. Dispense into serum bottles or Hungate tubes (under a nitrogen atmosphere) that can be sealed with rubber stoppers. Autoclave at 121°C for 15 min.

301. *METHYLOFERULA STELLATA* MEDIUM
KH_2PO_4 100.0 mg
$(NH_4)_2SO_4$ 100.0 mg
$MgSO_4 \times 7\ H_2O$ 50.0 mg
$CaCl_2 \times 2\ H_2O$ 10.0 mg
NaCl 20.0 mg
Fe-EDTA solution (see below) 3.0 ml
Trace elements solution (see below) 1.0 ml
Methanol 10.0 ml
Distilled water 1000.0 ml
Trace elements solution:
EDTA 5.0 g
$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
Fe-EDTA solution:
$FeSO_4 \times 7\ H_2O$ 1.54 g
Na_2EDTA 2.06 g
Distilled water 1000.0 ml
Final pH 5.0-5.8.
The medium is fairly weakly buffered so the pH should be checked before and after autoclaving at 121°C for 15 min. Methanol is filter sterilized. The pH should be adjusted with H_3PO_4 (sterilized if added to sterile medium). The strain should be grown with shaking.

302. *PALUDIBACULUM FERMENTANS* MEDIUM
KH_2PO_4 0.1 g
$(NH_4)_2SO_4$ 0.1 g

$MgSO_4 \times 7\ H_2O$ 0.05 g
$CaCl_2 \times 2\ H_2O$ 0.01 g
Yeast extract 0.1 g
Glucose 0.5 g
Phytagel 8.0 g
Distilled water 1000.0 ml
pH 5.5-6.0
Autoclave at 121°C for 15 min.

303. *AMMONIFEX* MEDIUM
KH_2PO_4 0.34 g
NH_4Cl 0.34 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
KCl 0.34 g
Trace element solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
$NaHCO_3$ 1.5 g
$Na_2S \times 9\ H_2O$ 0.7 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.5 g
NaCl 25.0 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
Na-formate 2.0 g
pH 7.0
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (*Mohr's* salt) 784.0 mg
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Vitamin solution:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 100.0 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except Na-formate, $Na_2S_2O_3$, vitamins and sulfide. Adjust pH to 3.5 with H_2SO_4 and sparge medium with 100% CO_2 gas for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic serum vials (e.g., 10 ml medium in 25 ml Balch-type tubes) and autoclave at 121°C for 15 min. Add Na-formate, $Na_2S_2O_3$, vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas.

304. *HALONATRONUM SACCHAROPHILUM* MEDIUM
KH_2PO_4 0.2 g

$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 0.5 g
KCl 0.2 g
NaCl 50.0 g
Na_2CO_3 68.0 g
$NaHCO_3$ 38.0 g
$Na_2S \times 9\ H_2O$ 0.7 g
Yeast extract 0.2 g
Sucrose 5.0 g
Trace elements solution (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
Resazurin 0.01 g
Distilled water 1000.0 ml
Final pH 9.5-10.0
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Prepare the medium without adding the vitamins, sucrose, yeast extract, NH_4Cl, Na_2CO_3, and $NaHCO_3$ using anaerobic conditions, under nitrogen. If the medium has been boiled to remove oxygen add the NH_4Cl, Na_2CO_3, and $NaHCO_3$ after the medium had cooled. Dispense into tubes stopper with rubber stoppers (serum tubes or bottles, or screw capped tubes). Autoclave at 121°C for 15 min, and to the cooled medium add the vitamins (filter sterilized under N_2), sucrose, yeast extract, and from anaerobic, sterile stock solutions.

305. *GEOGLOBUS* MEDIUM
NaCl 18.0 g

$MgCl_2 \times 6\ H_2O$ 4.0 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
$(NH_4)_2SO_4$ 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
$NaHCO_3$ 2.5 g
Na-acetate $\times 3\ H_2O$ 1.5 g
KH_2PO_4 0.33 g
Yeast extract 0.2 g
Vitamin solution (see below) 1.0 ml
Amorphous $Fe(OH)_3$ sludge (see below) 200.0 ml
Distilled water 800.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, acetate, phosphate, yeast extract, vitamins and amorphous iron. Suspend pellet of ferric iron hydroxide in medium and sparge with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Thereafter, dispense suspension under 80% N_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave for 30 min. Add acetate, phosphate, yeast extract and vitamins (sterilized by filtration) from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. The pH of the complete medium should be at 6.5 – 6.8.
Amorphous $Fe(OH)_3$: Slowly titrate 320 ml of a $FeCl_3 \times 6\ H_2O$ stock solution (60.0 g/l) with 10% (w/v) NaOH to pH 8.0-8.5 under agitation (use magnetic stirrer). Total amount of added NaOH approx. 80 – 100 ml. The precipitated $Fe(OH)_3$ should be stored at room temperature overnight with surface covered with water. Thereafter, centrifuge at 2000 rpm for 5 min and discard the supernatant. Resuspend the pellet in medium as described above.

306. *FERVIDICOCCUS* MEDIUM
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.44 g
$MgCl_2 \times 6\ H_2O$ 0.7 g
NaCl 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Yeast extract 0.5 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 0.8 g
Trypticase peptone 2.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except bicarbonate, trypticase, vitamins and sulfide), then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 - 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After autoclaving add Trypticase, vitamins and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas atmosphere and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Vitamins are sterilized by filtration. Adjust pH of complete medium to 6.0 - 6.1, if necessary.

307. *FERVIDOBACTERIUM* MEDIUM
NH_4Cl 0.9 g
NaCl 0.9 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KH_2PO_4 0.75 g
K_2HPO_4 1.5 g
Trace element solution (see below) 9.0 ml
$FeSO_4 \times 7\ H_2O$ solution (0.1% w/v in 0.1 N H_2SO_4) 3.0 ml

Yeast extract 3.0 g
Trypticase peptone 10.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
Vitamin solution (see below) 5.0 ml
D-Glucose 5.0 g
$Na_2S \times 9\ H_2O$ 1.0 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid (NTA) 12.8 g
$FeCl_2 \times 4\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$CoCl_2 \times 6\ H_2O$ 0.17 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2 \times 2\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6$ H2O 0.03 g
NaCl 1.0 g
$Na_2SeO_3 \times 5\ H_2O$ 0.03 g
Distilled water 1000.0 ml
First dissolve NTA in 200 ml of distilled water and adjust pH to 6.5 with KOH, then dissolve mineral salts. Finally adjust pH to 6.5 with KOH and make up to 1000.0 ml.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except vitamins, glucose and sulfide), sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add glucose, vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. Adjust pH of complete medium to 7.2 - 7.4.

308. *THERMOSIPHO AFFECTUS* MEDIUM
Sea salts (SIGMA) 30.0 g
Yeast extract (OXOID) 0.1 g
Trace element solution *SL-10* (see below) 1.0 ml
Trypticase peptone 2.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
D-Glucose 2.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.25 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g

$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except glucose, vitamins and sulfide, then sparge medium with 100% N_2 gas for 30 - 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After sterilization add glucose, vitamins and sulfide from sterile anoxic stock solution prepared under 100% N_2 gas. The vitamin solution should be sterilized by filtration. Adjust pH of complete medium to 6.5 – 7.0, if necessary.

309. *MOORELLA* MEDIUM
NH_4Cl 1.0 g
Na_2SO_4 2.0 g
$Na_2S_2O_3 \times 5\ H_2O$ 1.0 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
KH_2PO_4 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Yeast extract 1.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 2.0 g
Vitamin solution (see below) 10.0 ml
Na-DL-lactate 2.5 g
$Na_2S \times 9\ H_2O$ 0.1 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:

NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except bicarbonate, vitamins, lactate and sulfide), sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic, then dispense under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After autoclaving complete the medium by adding vitamins (sterilized by filtration), lactate and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas atmosphere. Adjust pH of the complete medium to 7.0 - 7.2, if necessary.

310. *CLOSTRIDIUM THERMOCELLUM* MEDIUM
$(NH_4)_2SO_4$ 1.3 g
$MgCl_2 \times 6\ H_2O$ 2.6 g
KH_2PO_4 1.43 g
K_2HPO_4 5.5 g
$CaCl_2 \times 2\ H_2O$ 0.13 g
Na_2-ß-glycerol phosphate $\times 4\ H_2O$ 6.0 g
$FeSO_4 \times 7\ H_2O$ solution (0.1% w/v in 0.1 N H_2SO_4) 1.1 ml
L-Glutathione reduced 0.25 g
Yeast extract 4.5 g
Na-resazurin solution (0.1% w/v) 0.5 ml
Cellobiose 5.0 g
Distilled water 1000.0 ml
Dissolve ingredients except cellobiose, sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Then adjust pH to 7.0 - 7.2, distribute under same gas atmosphere in anoxic Hungate-type tubes or serum vials and autoclave. Cellobiose is added to the sterile medium from an anoxic 10% (w/v) stock solution prepared under 100% N_2 gas and sterilized by filtration.

311. *CLOSTRIDIUM* MEDIUM I
K_2HPO_4 3.0 g
KH_2PO_4 2.0 g
NH_4Cl 2.0 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Yeast extract 5.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
D-Glucose 5.0 g
L-Cysteine-HCl $\times\ H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Dissolve ingredients except glucose, cysteine and sulfide. Sparge medium with 100% N_2 gas for 30 –

45 min to make it anoxic, then dispense under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add glucose, cysteine and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. Adjust pH of the complete medium to 7.0 - 7.2, if necessary.

312. *THERMOTOGA NEAPOLITANA* MEDIUM
Starch, soluble 5.0 g
KH_2PO_4 0.5 g
Trace element solution (see below) 15.0 ml
$NiCl_2 \times 6\ H_2O$ solution (0.1% w/v) 2.0 ml
Sea water (see below) 250.0 ml
Yeast extract 2.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
L-Cysteine-HCl $\times\ H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 750.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Artificial sea water:
NaCl 27.7 g
$MgSO_4 \times 7\ H_2O$ 7.0 g
$MgCl_2 \times 6\ H_2O$ 5.5 g
KCl 0.65 g
NaBr 0.1 g
H_3BO_3 30.0 mg
$SrCl_2 \times 6\ H_2O$ 15.0 mg
Citric acid 10.0 mg
KI 0.05 mg
$CaCl_2 \times 2\ H_2O$ 2.25 g
Distilled water 1000.0 ml
Dissolve ingredients (except sulfide and cysteine) and adjust pH to 6.5. Boil medium for 1 min, then cool to room temperature under 100% N_2 gas atmosphere. Dispense under same gas atmosphere into anoxic Hungate-type tubes or serum vials to 30% of volume and autoclave. Add sulfide and cysteine from sterile anoxic stock solutions prepared under 100% N_2 gas. Adjust pH of complete medium to 6.5, if necessary.

313. *PYROCOCCUS* MEDIUM
NaCl 13.85 g

$MgSO_4 \times 7\ H_2O$ 3.5 g
$MgCl_2 \times 6\ H_2O$ 2.75 g
KCl 0.33 g
NaBr 0.05 g
H_3BO_3 15.0 mg
$SrCl_2 \times 6\ H_2O$ solution (0.1% w/v) 7.0 ml
$(NH_4)_2SO_4$ 10.0 mg
Citric acid solution (0.1% w/v) 5.0 ml
KI solution (0.01% w/v) 0.5 ml
$CaCl_2 \times 2\ H_2O$ 0.75 g
KH_2PO_4 0.5 g
$NiCl_2 \times 6\ H_2O$ (0.1% w/v) 2.0 ml
Trace element solution (see below) 10.0 ml
Peptone (BD Bacto) 5.0 g
Yeast extract (OXOID) 1.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
Sulfur, powdered 30.0 g
Neutralized sulfide solution 16.7 ml
Distilled water 1000.0 ml
Neutralized sulfide solution:
$Na_2S \times 9\ H_2O$ 3.0 g
Distilled water 100.0 ml
The sulfide solution is prepared in a 250 ml screw-capped bottle with a butyl rubber septum and a magnetic stirrer. The solution is bubbled with nitrogen gas, closed and autoclaved for 15 min. at 121°C. After cooling to room temperature the pH is adjusted to about 7.0 by adding of sterile 2 N H_2SO_4 drop-wise with a syringe without opening the bottle. Appearance of a yellow colour indicates the drop of pH to about 8. The solution should be stirred continuously to avoid precipitation of elemental sulfur. The final solution should be clear and is yellow in colour.
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg

p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except sulfur and sulfide, adjust the pH to 6.5, and sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Distribute medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials that contain already the appropriate amount of sulfur. Sterilize medium by heating cultivation vessels in a boiling water bath for 1 - 2 hours on each of 3 successive days. Add neutralized sulfide stock solution.

314. *NATRANAEROBACULUM* MEDIUM
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 1.0 g
KCl 0.2 g
NaCl 16.0 g
Trace element solution *SL-11* (see below) 1.0 ml
Yeast extract 0.2 g
Na-resazurin solution (0.1% w/v) 0.5 ml
Na_2CO_3 68.0 g
$NaHCO_3$ 38.0 g
Ethanol 5.0 ml
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 1.0 g
Distilled water 1000.0 ml
Trace element solution SL-11:
Na_2-EDTA $\times 2\ H_2O$ 5.2 g
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 1000.0 ml
Dissolve EDTA in 800.0 ml distilled water, adjust pH to 7 using 2 N NaOH and add ferrous chloride. After ferrous chloride has dissolved add other compounds. Finally adjust pH to 6.0 and bring volume to 1000.0 ml.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except carbonate, bicarbonate, ethanol, vitamins and sulfide. Sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Add and dissolve carbonates and sulfide while gassing the head space only. Dispense under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Before use add ethanol and vitamins from sterile anoxic stock solution

prepared under 100% N_2 gas. Vitamins are sterilized by filtration. Adjust pH of the complete medium to 9.5 – 10.0, if necessary.

315. *FUCHSIELLA* MEDIUM
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 0.5 g
KCl 0.2 g
NaCl 60.0 g
Na_2CO_3 68.3 g
$NaHCO_3$ 38.3 g
Trace element solution *SL-4* (see below) 1.0 ml
Resazurin 0.5 mg
Vitamin solution (see below) 10.0 ml
Yeast extract 0.05 g
Ethanol (50% v/v) 10.0 ml
$Na_2S \times 9\ H_2O$ 1.0 g
$NaNO_3$ 0.85 g
Distilled water 1000.0 ml
Trace element solution SL-4:
EDTA 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.2 g
Trace element solution *SL-6* (see below) 100.0 ml
Distilled water 900.0 ml
Trace element solution SL-6:
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 8.8- 9.5
Dissolve ingredients except the sodium carbonate, sodium bicarbonate, ethanol, and sodium sulfide. Boil medium for a few minutes and cool to room temperature while flushing with N_2. Add and dissolve sodium carbonate, sodium bicarbonate and sodium sulfide while gassing the head space only. Dispense and autoclave under N_2. Before use add 10 ml/l (v/v) of 50% (v/v) ethanol solution (flushed and autoclaved under N_2).

316. *MELIORIBACTER* MEDIUM
Solution A:

NaCl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
KCl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
NH_4Cl 0.25 g
KH_2PO_4 0.2 g
Na_2SO_4 4.0 g
Trace element solution (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
Yeast extract 2.0 g
$NaHCO_3$ 0.1 g
Distilled water 1000.0 ml
pH 7.2 – 7.8
Solution B:
$Na_2S \times 9\ H_2O$ 3.0 g
Distilled water 100.0 ml
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ 784.0 mg
$ZnSO_4 \times 7\ H_2O$ 143.6 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Na_2SeO_4 94.6 mg
H_3BO_3 6.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$CuCl_2 \times 2\ H_2O$ 1.8 mg
$CoCl_2 \times 6\ H_2O$ 238.0 mg
$NiSO_4(NH_4)_2SO_4 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
conc. HCl 10.0 ml
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Autoclave and add the following component after autoclaving from stock solutions: sterile solution B Na_2S (3%) end concentration 0.3% and filter-sterilized vitamin solution (see below) 0.1 ml /10 ml.

317. *ORNATILINEA* MEDIUM
KH_2PO_4 0.14 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.15 g
NH_4Cl 0.54 g
Trace element solution *SL-11* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 2.5 g
Yeast extract 2.3 g

Vitamins solution (see below) 10.0 ml
D-Glucose 2.2 g
L-Cysteine-HCl × H_2O 0.25 g
Na_2S × 9 H_2O 0.25 g
Distilled water 1000.0 ml
Trace element solution SL-11:
Na_2-EDTA × 2 H_2O 5.2 g
$FeCl_2$ × 4 H_2O 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2$ × 4 H_2O 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2$ × 6 H_2O 190.0 mg
$CuCl_2$ × 2 H_2O 2.0 mg
$NiCl_2$ × 6 H_2O 24.0 mg
Na_2MoO_4 × 2 H_2O 36.0 mg
Distilled water 1000.0 ml
Dissolve EDTA in 800 ml distilled water, adjust pH to 7 using 2 N NaOH and add ferrous chloride. After ferrous chloride has dissolved add other compounds. Finally adjust pH to 6.0 and bring volume to 1000.0 ml.
Selenite-tungstate solution:
NaOH 0.5 g
Na_2SeO_3 × 5 H_2O 3 mg
Na_2WO_4 × 2 H_2O 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except bicarbonate, yeast extract, vitamins, glucose and reducing agents), then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Add solid bicarbonate and adjust pH to 7.0. Dispense medium under 80% N_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add yeast extract, vitamins (sterilized by filtration), glucose, sulfide and cysteine from sterile anoxic stock solutions prepared under 100% N_2 gas. Adjust pH of complete medium to 7.0, if necessary.

318. *TEPIDIBACILLUS* MEDIUM
Sea salts (SIGMA) 30.0 g
$NaNO_3$ 1.0 g
Wolfe's mineral elixier (see below) 2.0 ml
$VOSO_4$ × 5 H_2O solution (0.01% w/v) 0.5 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
$FeSO_4$ × 7 H_2O 0.1 g
$NaHCO_3$ 1.0 g
Yeast extract 0.5 g
D-glucose 2.5 g
Vitamins solution (see below) 20.0 ml

Distilled water 1000.0 ml
Wolfe's mineral elixier:
$MgSO_4 \times 7\ H_2O$ 30.0 g
$MnSO_4 \times H_2O$ 5.0 g
NaCl 10.0 g
$FeSO_4 \times 7\ H_2O$ 1.0 g
$CoCl_2 \times 6\ H_2O$ 1.8 g
$CaCl_2 \times 2\ H_2O$ 1.0 g
$ZnSO_4 \times 7\ H_2O$ 1.8 g
$CuSO_4 \times 5\ H_2O$ 0.1 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.18 g
H_3BO_3 0.1 g
$Na_2MoO_4 \times 2\ H_2O$ 0.1 g
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 2.8 g
$Na_2WO_4 \times 2\ H_2O$ 0.1 g
Na_2SeO_4 0.1 g
Distilled water 1000.0 ml First adjust pH to 1.0 with diluted H2SO4, then add and dissolve the salts.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except ferrous sulfate, bicarbonate, yeast extract, D-glucose and vitamins), adjust pH to 7.0 and sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Dispense the medium under same gas atmosphere into Hungate-type tubes or serum vials and autoclave. Add ferrous sulfate, bicarbonate, yeast extract, pyruvate and vitamins from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas atmosphere. Prepare the stock solution of ferrous sulfate by dissolving 1% (w/v) $FeSO_4 \times 7\ H_2O$ in 0.1 N H_2SO_4. The stock solutions of pyruvate and vitamins should be sterilized by filtration. Adjust pH of the complete medium to 6.8-7.0. Note: It may be necessary to add 10-20 mg sodium dithionite per liter (e.g. from 5% (w/v) solution, freshly prepared under 100% N_2 and filter-sterilized), if the medium is not completely reduced after inoculation.

319. *DEFERRISOMA* MEDIUM
KH_2PO_4 0.33 g
NH_4Cl 0.33 g
KCl 0.33 g
NaCl 18.0 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
$MgCl_2 \times 6\ H_2O$ 4.0 g
Yeast extract 0.2 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Fe(III)-citrate (19% Fe) 2.5 g
$NaHCO_3$ 2.5 g
Vitamin solution (see below) 10.0 ml
Distilled water 1000.0 ml

Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except ferric citrate, bicarbonate and vitamins) and sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add ferric citrate (dissolve by boiling and adjust pH to 6.5 – 7.0) and vitamins from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Sterilize vitamins by filtration. Adjust pH of the complete medium to 6.5, if necessary.

320. *THERMOSULFURIMONAS* MEDIUM
NaCl 18.0 g
$MgCl_2 \times 6\ H_2O$ 4.0 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
$(NH_4)_2SO_4$ 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
$NaHCO_3$ 2.5 g
KH_2PO_4 0.33 g
Vitamin solution (see below) 1.0 ml
Na-acetate $\times 3\ H_2O$ 1.5 g
$Na_2S_2O_3 \times 5\ H_2O$ 3.5 g
Yeast extract 0.2 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g

$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, phosphate, vitamins, acetate, thiosulfate and yeast extract, then sparge medium with 80% H_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add phosphate, vitamins, acetate, thiosulfate and yeast extract from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Stock solutions of thiosulfate and vitamins should be sterilized by filtration. The pH of the complete medium should be at 6.5 – 6.8.

321. *BROCKIA LITHOTROPHICA* MEDIUM
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.44 g
$MgCl_2 \times 6\ H_2O$ 0.7 g
NaCl 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Sulfur, powdered 10.0 g
$NaHCO_3$ 0.8 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg

$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except sulfur, bicarbonate, vitamins and sulfide), then sparge medium with 80% H_2 and 20% CO_2 gas mixture for 30 - 45 min to make it anoxic. Adjust pH to 6.2 - 6.4, and dispense medium under 80% H_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials containing already the appropriate amount of sulfur. Sterilize medium by heating cultivation vessels in a boiling water bath for 2 - 3 hours on each of 3 successive days. After sterilization add bicarbonate from a sterile stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Vitamins (sterilized by filtration) and sulfide are added to the medium from sterile anoxic stock solutions prepared under 100% N_2 gas. Adjust pH of complete medium to 6.5, if necessary.

322. *CLOSTRIDIUM* MEDIUM II
Ground beef (fat free) 500.0 g
Distilled water 1000.0 ml
NaOH 1 N 25.0 ml
Use lean beef or horse meat. Remove fat and connective tissue before grinding. Mix meat, water and NaOH, then boil for 15 min with stirring. Cool to room temperature, skim fat off surface, and filter, retaining both meat particles and filtrate. To the filtrate add water to a final volume of 1000.0 ml, and then add:
Casitone 30.0 g
Yeast extract 5.0 g
K_2HPO_4 5.0 g
Resazurin solution (0.1% w/v) 0.5 ml
Glucose 4.0 g
Cellobiose 1.0 g
Maltose 1.0 g
Starch (soluble) 1.0 g
To make medium anoxic boil it, cool under 100% N_2 gas atmosphere, add 0.5 g/l L-cysteine hydrochloride and adjust pH to 7.0. Dispense under same gas atmosphere 7.0 ml medium into Hungate-type tubes.

323. PSYCHROPHYLIC *CLOSTRIDIUM* MEDIUM
Tryptone 10.0 g
Gelatin peptone 10.0 g
Yeast extract 5.0 g

D-glucose 1.0 g
Sodium chloride 5.0 g
L-Arginine 1.0 g
Sodium pyruvate 1.0 g
Menadione 0.5 mg
Haemin 5.0 mg
Distilled water 990 ml
Dissolve all components in distilled water and add 0.5 ml/l Na-resazurin solution (0.1% w/v), bring to the boil and cool to room temperature while sparging with 80% N_2 and 20% CO_2 gas mixture. Add L-cysteine-HCl × H_2O (0.3 g/l), dispense the medium into anoxic Hungate-type tubes or serum vials and autoclave. After autoclaving supplement medium with 5.0 g/l D-glucose added from a sterile anoxic stock solution sterilized by filtration. Adjust pH of medium to 6.8 with a sterile anoxic stock solution of Na_2CO_3 (5% w/v) prepared under 80% N_2 and 20% CO_2 gas atmosphere.

324. *SPHAEROCHAETA* MEDIUM
NaCl 1.0 g
KCl 0.5 g
$MgCl_2$×6 H_2O 0.4 g
$CaCl_2$×2 H_2O 0.1 g
NH_4Cl 0.3 g
KH_2PO_4 0.2 g
Na_2SO_4 0.15 g
Xylose 20 mmol
Yeast extract 1.0 g
$NaHCO_3$ 0.5 g
Trace element solution *SL-7* (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 990.0 ml
Trace mineral solution:
$FeCl_2$ × 4 H_2O 1.99 g
$CoCl_2$ 0.13 g
$MnCl_2$ × 4 H_2O 0.198 g
$ZnCl_2$ 0.136 g
H_3BO_3 0.0 62 g
$NiCl_2$ × 6 H_2O 0.013 g
$AlCl_3$ × 6 H_2O 0.0133 g
Na_2MoO_4 × 2 H_2O 0.0242 g
$CuCl_2$ × 2 H_2O 0.0 17 g
Distilled water 1000.0 ml
Seven vitamins solution:
Vitamin B_{12} 100.0 µg
p-Aminobenzoic acid 80.0 mg
D(+)-Biotin 20.0 mg
Nicotinic acid 200.0 mg
Calcium pantothenate 100.0 mg
Pyridoxine hydrochloride 300.0 mg
Thiamine-HCl × 2 H_2O 200.0 mg
Distilled water 1000.0 ml
Dissolve all components in distilled water and add 0.5 ml/l Na-resazurin solution (0.1% w/v), bring to the boil and cool to room temperature while sparging with 80% N_2 and 20% CO_2 gas mixture. Add L-cysteine-HCl × H_2O (0.3 g/l), dispense the medium into anoxic Hungate-type tubes or serum vials and autoclave. Sodium hydrogen carbonate, vitamins, xylose and antibiotics (when necessary) were added to the autoclaved medium from sterile anaerobic stock solutions. Adjust pH of medium to 7.2-7.3 with

a sterile anoxic stock solution of Na_2CO_3 (5% w/v) prepared under 80% N_2 and 20% CO_2 gas atmosphere.

325. *COPROBACTER* MEDIUM

Ground beef (fat free) 500.0 g
Distilled water 1000.0 ml
NaOH 1 N 25.0 ml
Mix meat, water and NaOH, then boil for 15 min with stirring. Cool to room temperature, skim fat off surface, and filter, retaining both meat particles and filtrate.
To the filtrate add water to a final volume of 1000.0 ml, and then add:
Casitone 30.0 g
Yeast extract 5.0 g
K_2HPO_4 5.0 g
Resazurin 1.0 mg
To make medium anoxic bring it to a boil, cool under 100% N_2 gas atmosphere, add 0.5 g/l L-cysteine hydrochloride and adjust pH to 7.0. Dispense under 100% N_2 gas atmosphere by filling 7 ml medium into anoxic Hungate-type tubes. Autoclave at 121°C for 15 min. Add to 1000.0 ml of medium after autoclaving: Haemin solution (see below) 10.0 ml Vitamin K1 or Vitamin K3 solution (see below) 0.2 ml.
Haemin solution: Dissolve 50 mg haemin in 1.0 ml 1 N NaOH; make up to 100.0 ml with distilled water and filter sterilize. Store refrigerated.
Vitamin K_1 solution: Dissolve 0.1 ml of vitamin K_1/K_3 in 20.0 ml 95% ethanol and filter sterilize. Store refrigerated in a brown bottle.
Vitamin K_3 solution: Dissolve 5 mg/ml of vitamin K_3 in 10.0 ml 95% ethanol and filter sterilize. Store refrigerated in a brown bottle.

326. *METHANOCALCULUS NATRONOPHILUS* MEDIUM

KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 1.0 g
KCl 0.2 g
NaCl 60.0 g
Trace element solution *SL-11* (see below) 1.0 ml
Na-acetate $\times 3\ H_2O$ 0.2 g
Na-resazurin solution (0.1% w/v) 0.5 ml
Na_2CO_3 68.0 g
$NaHCO_3$ 38.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 1.0 g
Distilled water 1000.0 ml
Trace element solution SL-11:
Na_2-EDTA $\times 2\ H_2O$ 5.2 g
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 1000.0 ml
Dissolve EDTA in 800 ml distilled water, adjust pH to 7 using 2 N NaOH and add ferrous chloride. After ferrous chloride has dissolved add other compounds. Finally adjust pH to 6.0 and bring volume to 1000.0 ml.

Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except carbonate, bicarbonate, vitamins and sulfide, then sparge medium with 80% H_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Add and dissolve carbonates and sulfide while gassing the head space only. Dispense under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Before use add vitamins from an anoxic stock solution sterilized by filtration. Adjust pH of the complete medium to 9.0.

327. *THERMOANAEROBACTER SIDEROPHILUS* MEDIUM
Tryptone 1.0 g
Peptone (meat) 1.0 g
Yeast extract 1.0 g
K_2HPO_4 1.6 g
NaH_2PO_4 × 2 H_2O 1.0 g
NH_4Cl 0.5 g
$MgSO_4$ × 6 H_2O 0.16 g
Trace element solution *SL-11* (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
$CaCl_2$ × 2 H_2O 0.06 g
$NaHCO_3$ 1.0 g
Vitamin solution (see below) 10.0 ml
L-Cysteine-HCl × H_2O 0.3 g
Na_2S × 9 H_2O 0.3 g
Distilled water 1000.0 ml
Trace element solution SL-11:
Na_2-EDTA × 2 H_2O 5.2 g
$FeCl_2$ × 4 H_2O 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2$ × 4 H_2O 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2$ × 6 H_2O 190.0 mg
$CuCl_2$ × 2 H_2O 2.0 mg
$NiCl_2$ × 6 H_2O 24.0 mg
Na_2MoO_4 × 2 H_2O 36.0 mg
Distilled water 1000.0 ml
Dissolve EDTA in 800 ml distilled water, adjust pH to 7 using 2 N NaOH and add ferrous chloride. After ferrous chloride has dissolved add other compounds. Finally adjust pH to 6.0 and bring volume to 1000.0 ml.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg

Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except calcium chloride, bicarbonate, glucose, vitamins, cysteine and sulfide), adjust pH to 7.0 and sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After sterilization add calcium chloride, glucose, cysteine and sulfide from sterile anoxic stock solutions autoclaved under 100% N_2 gas atmosphere. Add bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Vitamins are prepared under 100% N_2 gas and sterilized by filtration. The pH of the complete medium should be at 7.0.

328. *MOORELLA GLYCERINI* MEDIUM
KH_2PO_4 0.33 g
NH_4Cl 0.33 g
KCl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
Yeast extract 0.5 g
Glycerol (87%) 3.0 ml
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 10.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg

p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, vitamins and sulfide, then sparge medium with 100% CO_2 gas for 30 – 45 min to make it anoxic. Dissolve bicarbonate and adjust pH to 6.7, then dispense medium under the same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add vitamins and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. Vitamins should be sterilized by filtration

329. *TEPIDIBACTER* MEDIUM
NaCl 18.0 g
$MgCl_2 \times 6\ H_2O$ 4.0 g
KCl 0.34 g
NH_4Cl 0.25 g
$CaCl_2 \times 2\ H_2O$ 0.11 g
K_2HPO4 0.18 g
$Fe(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 20.0 mg
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Yeast extract 0.2 g
Proteose peptone 10.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 5.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml

Dissolve ingredients (except bicarbonate, vitamins and sulfide), then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 - 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas atmosphere. The pH of the complete medium should be 6.5 - 7.0.

330. *CLOSTRIDIUM CELLULOLYTICUM* MEDIUM
$(NH_4)_2SO_4$ 1.3 g
KH_2PO_4 1.5 g
$K_2HPO_4 \times 3\ H_2O$ 2.9 g
$FeSO_4 \times 7\ H_2O$ solution (0.1% w/v in 0.1 N H_2SO_4) 1.25 ml
Trace element solution *SL-10* (see below) 1.0 ml
Yeast extract 2.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 75.0 mg
Cellobiose 6.0 g
L-Cysteine-HCl $\times\ H_2O$ 0.5 g
Na_2CO_3 2.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Dissolve ingredients except magnesium chloride, calcium chloride, cellobiose, cysteine and carbonate, then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Dispense medium under the same gas atmosphere into anoxic Hungate-type tubes and autoclave. After autoclaving add magnesium chloride, calcium chloride and cellobiose from anoxic stock solutions prepared under 100% N_2 gas. Cellobiose has to be sterilized by filtration. Prior to inoculation add cysteine from a sterile anoxic stock solution prepared under 100% N_2 gas and adjust pH to 7.2 by adding a sterile anoxic stock solution of Na_2CO_3 (5% w/v) prepared under 80% N_2 and 20% CO_2 gas atmosphere.

331. *THERMOCOCCUS STETTERI* MEDIUM
NH_4Cl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
KCl 0.33 g
KH_2PO_4 0.33 g
Casitone 5.0 g
Trace element solution *SL-10* (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Sulfur, powder 10.0 g
NaCl 2.5 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g

Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except sulfur, vitamins and sulfide) and sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 - 45 min to make it anoxic. Adjust pH to 5.7, dispense under 80% N_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials containing already the appropriate amount of sulfur and sterilize by heating for 2-3 hours in a boiling water bath. Add vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Prior to use adjust pH of complete medium to 6.5 with sterile, anaerobic $NaHCO_3$-solution.

332. *THERMOGUTTA* MEDIUM
KH_2PO_4 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
NH_4Cl 0.33 g
KCl 0.33 g
NaCl 6.0
Yeast extract 0.2 g
Xanthan 5.0 g
KNO_3 2.0 g
$NaHCO_3$ 2.0 g
Trace element solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (Mohr's salt) 784.0 mg
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg

H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Mohr's salt is dissolved firstly in concentrated HCl, and then is mixed with water and other salts are dissolved in the sequence indicated.
Vitamin solution:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 10.0 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
The media was boiled and cooled under the flow of oxygen-free gases (CO_2 or N_2) to render the media anaerobic and finally heat-sterilized at 121°C for 60 min. No reducing agents were added.

333. MEDIUM FOR PSYCHROPHILIC *METHANOSARCINA*
K_2HPO_4 0.35 g
KH_2PO_4 0.23 g
NH_4Cl 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.25 g
NaCl 2.25 g
$FeSO_4 \times 7\ H_2O$ solution (0.1% w/v in 0.1 H_2SO_4) 2.0 ml
Trace element solution *SL-10* (see below) 1.0 ml
Yeast extract 2.0 g
Casitone 2.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 0.85 g
Vitamin solution (see below) 10.0 ml
Methanol 10.0 ml
L-Cysteine-HCl $\times\ H_2O$ 0.3 g
$Na_2S \times 9\ H_2O$ 0.3 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg

Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except bicarbonate, vitamins, methanol, cysteine and sulfide) and sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Then add and dissolve bicarbonate, adjust pH to 6.8 and dispense medium under 80% N_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Methanol (50% v/v stock solution) and the reducing agents are each autoclaved separately under 100% N_2 gas atmosphere as concentrated solutions in tightly closed tubes. Vitamins are prepared under 100% N_2 gas atmosphere and sterilized by filtration. Appropriate volumes of the solutions are injected into the sterile medium with hypodermic syringes. Adjust pH of the complete medium to 6.5 - 6.8, if necessary.

334. *METHANOSPIRILLUM* MEDIUM
KH_2PO_4 0.23 g
K_2HPO_4 0.23 g
$MgSO_4 \times 7\ H_2O$ 0.09 g
NaCl 0.46 g
NH_4Cl 0.4 g
$CaCl_2 \times 2\ H_2O$ 60.0 mg
$(NH_4)_2SO_4 \times 7\ H_2O$ 0.23 g
Trace element solution *SL-10* (see below) 10.0 ml
Vitamin solution (see below) 10.0 ml
Yeast extract 1.0 g
Na-acetate $\times 3\ H_2O$ 1.0 g
Na-formate 2.0 g
Trypticase 0.5 g
Casamino acids 0.2 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 4.0 g
L-Cysteine-HCl $\times\ H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 980.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg

Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, cysteine and sulfide. Sparge medium with 80% H_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Add and dissolve bicarbonate, then dispense medium under 80% H_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes and autoclave. Add cysteine and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. Prior to use check pH of complete medium and adjust to 6.8 - 7.0, if necessary.

335. *CARNOBACTERIUM* MEDIUM
Trypticase soy broth 30.0 g
Yeast extract 3.0 g
NaCl 13.0 g
KCl 0.34 g
$MgCl_2 \times 6\ H_2O$ 4.0 g
$MgSO_4 \times 7\ H_2O$ 3.45 g
NH_4Cl 0.25 g
$CaCl_2 \times 2\ H_2O$ 0.14 g
Distilled water 1000.0 ml
Adjust pH to 7.

336. ALKALIPHILIC *SPIROCHAETE* MEDIUM
Na_2CO_3 10.0 g
$NaHCO_3$ 15.0 g
NaCl 10.0 g
K_2HPO_4 0.2 g
NH_4Cl 1.0 g
KCl 0.2 g
$Na_2S \times 9\ H_2O$ 1.0 g
Yeast extract 0.5 g
Sucrose 5.0 g
Vitamin solution (see below) 10.0 ml
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg

Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Prepare the medium under N_2, omitting Na_2CO_3, $NaHCO_3$, Na_2S × 9 H_2O, sucrose and vitamin solution. Boil the medium and cool under nitrogen, add the Na_2CO_3 and $NaHCO_3$ and adjust the pH to 9.7 with 6N NaOH (about 15 ml). Autoclave at 121°C for 15 min and add the Na_2S × 9 H_2O (neutralized), vitamins and sucrose from sterile stock solutions.

337. *CUNICULIPLASMA* MEDIUM
Beef extract 3 g
Betaine 0.6 g
$(NH_4)_2SO_4$ 1.3 g
KH_2PO_4 0.28 g
$MgSO_4$ × 7 H_2O 0.25 g
$CaCl_2$ × 2 H_2O 0.07 g
$FeCl_3$ × 6 H_2O 0.02 g
Trace element solution *SL-10* (see below) 1.0 ml
Vitamin solution (see above) 10.0 ml
Distilled water 990.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2$ × 4 H_2O 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2$ × 4 H_2O 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2$ × 6 H_2O 190.0 mg
$CuCl_2$ × 2 H_2O 2.0 mg
$NiCl_2$ × 6 H_2O 24.0 mg
Na_2MoO_4 × 2 H_2O 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
myo-Inositol 1.0 g
Thiamine-HCl 100.0 mg
Pyridoxine-HCl 100.0 mg
Folic acid 40.0 mg
D-Biotin 10.0 mg
L-Ascorbic acid 200.0 mg
D-Ca- pantothenate 100.0 mg
Choline chloride 100.0 mg
Nicotinamide 100.0 mg
Riboflavin 20.0 mg
Vitamin B_{12} 20.0 µg
Vitamin A 10.0 mg
p-Aminobenzoic acid 20.0 mg
Distilled water 990.0 ml

The medium was adjusted to pH 1.0–1.2 with concentrated H_2SO_4. The cultures were incubated for about 5 days at 37°C with shaking.

338. *MAGNETOSPIRILLUM* MEDIUM

KH_2PO_4 0.68 g
$NaNO_3$ 0.12 g
L(+)-Tartaric acid 0.37 g
Succinic acid 0.37 g
Na-acetate × 3 H_2O 0.05 g
Vitamin solution (see below) 10.0 ml
Trace element solution (see below) 5.0 ml
Fe(III) quinate solution (see below) 2.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Na-thioglycolate 0.05 g
Distilled water 1000.0 ml

Trace element solution:

Nitrilotriacetic acid 1.5 g
$MgSO_4$ × 7 H_2O 3.0 g
$MnSO_4$ × H_2O 0.5 g
NaCl 1.0 g
$FeSO_4$ × 7 H_2O 0.1 g
$CoSO_4$ × 7 H_2O 0.18 g
$CaCl_2$ × 2 H_2O 0.1 g
$ZnSO_4$ × 7 H_2O 0.18 g
$CuSO_4$ × 5 H_2O 0.01 g
$KAl(SO_4)_2$ × 12 H_2O 0.02 g
H_3BO_3 0.01 g
Na_2MoO_4 × 2 H_2O 0.01 g
$NiCl_2$ × 6 H_2O 0.03 g
Na_2SeO_3 × 5 H_2O 0.3 mg
Na_2WO_4 × 2 H_2O 0.4 mg
Distilled water 1000.0 ml

First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.

Vitamin solution:

Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml

Ferric Quinate Solution, 0.01 M:

$FeCl_3$ × 6 H_2O 4.5 g
Quinic acid 1.9 g
Distilled water 1000.0 ml

Sterilize by filtration under 100% N_2 gas atmosphere.

Dissolve ingredients (except thioglycolate) and adjust pH to 6.75 with NaOH. Sparge medium with 100% N_2 gas for 30-45 min and dispense under the same gas atmosphere into anoxic Hungate – type tubes to 50% of their volume. Before inoculation add thioglycolate from a 0.5% (w/v) stock solution,

freshly prepared under 100% N_2 gas and filter-sterilized. Then add sterile air to a concentration of 2.5 % O_2 in the vial.

339. *ACETOBACTERIUM* MEDIUM

NH_4Cl 1.0 g
KH_2PO_4 0.33 g
K_2HPO_4 0.45 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
Trace element solution (see below) 20.0 ml
Yeast extract 2.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 10.0 g
D-Fructose 10.0 g
Vitamin solution (see below) 10.0 ml
L-Cysteine-HCl $\times H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml

Dissolve ingredients except bicarbonate, fructose, vitamins, cysteine and sulfide, bring to the boil and cool to room temperature under 80% N_2 and 20% CO_2 gas mixture. Add bicarbonate (solid) and equilibrate the medium with the gas until a pH of around 7.4 is reached. Then distribute under the same gas atmosphere in anoxic Hungate-type tubes or serum vials and autoclave. Before use adjust the

pH to 8.0 - 8.2 by adding a sterile anoxic stock solution of sodium carbonate (5% w/v) prepared under 80% N_2 and 20% CO_2 gas mixture (0.25 ml per 10.0 ml medium) and add fructose, vitamins (sterilized by filtration), cysteine and sulfide from anoxic sterile stock solutions prepared under 100% N_2.

340. *DISSULFURIMICROBIUM* MEDIUM

KH_2PO_4 0.33 g
NH_4Cl 0.33 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
$MgCl_2 \times 6\ H_2O$, 0.33 g
$NaHCO_3$ 2.0 g
Vitamin solution (see below) 10.0 ml
Trace element solution (see below) 1.0 ml
Ferrihydrite
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4
Trace element solution:
Na_2-EDTA $\times 2\ H_2O$ 5.2 g
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 1000.0 ml
Dissolve EDTA in 800 ml distilled water, adjust pH to 7 using 2 N NaOH and add ferrous chloride. After ferrous chloride has dissolved add other compounds. Finally adjust pH to 6.0 and bring volume to 1000.0 ml.
The pH of the autoclaved medium was 6.7–6.8.
Medium (10.0 ml) was dispensed into 17 ml Hungate tubes; the headspace was filled with CO_2 (100 %).

341. *RUTHENIBACTERIUM* MEDIUM

Trypticase peptone 5.0 g
Peptone 5.0 g
Yeast extract 10.0 g
Beef extract 5.0 g
Glucose 5.0 g

K_2HPO_4 2.0 g
Tween 80 1.0 ml
L-Cysteine-HCl × H_2O 0.5 g
Resazurin 1.0 mg
Salt solution (see below) 40.0 ml
Distilled water 950.0 ml
Haemin solution (see below) 10.0 ml
Vitamin K_1 solution (see below) 0.2 ml
The vitamin K_1, haemin solution and the cysteine are added after the medium has been boiled and cooled under CO_2. Adjust pH to 7.2 using 8 N NaOH. Distribute under N_2 and autoclave.
Salt solution:
$CaCl_2$ × 2 H_2O 0.25 g
$MgSO_4$ × 7 H_2O 0.5 g
K_2HPO_4 1.0 g
KH_2PO_4 1.0 g
$NaHCO_3$ 10.0 g
NaCl 2.0 g
Distilled water 1000.0 ml
Haemin solution: Dissolve 50 mg haemin in 1.0 ml 1 N NaOH; make up to 100.0 ml with distilled water. Store refrigerated.
Vitamin K_1 solution: Dissolve 0.1 ml of vitamin K_1 in 20.0 ml 95% ethanol and filter sterilize. Store refrigerated in a brown bottle.

342. *RHODOVULUM* MEDIUM
Yeast extract 0.3 g
Na_2-succinate 1.0 g
(NH_4)-acetate 0.5 g
Fe(III) citrate solution (0.1% in H_2O) 5.0 ml
KH_2PO_4 0.5 g
$MgSO_4$ × 7 H_2O 0.4 g
NaCl 0.4 g
NH_4Cl 0.4 g
$CaCl_2$ × 2 H_2O 0.05 g
Vitamin B_{12} solution (10 mg in 100 ml H_2O) 0.4 ml
Trace element solution *SL-6* (see below) 1.0 ml
L-Cysteine chloride × H_2O 0.3 g
Resazurin (0,1%) 0.5 ml
Distilled water 1000.0 ml
Adjust pH to 6.8. Boil the medium for a few minutes. Bubble the medium with nitrogen gas and fill 10.0 ml in tubes with a rubber septum under a stream of nitrogen gas. Autoclave at 121°C for 15 min. Sterile syringes are used to inoculate and remove samples. Incubate in the light using a tungsten lamp.
Trace element solution SL-6:
$ZnSO_4$ × 7 H_2O 0.1 g
$MnCl_2$ × 4 H_2O 0.03 g
H_3BO_3 0.3 g
$CoCl_2$ × 6 H_2O 0.2 g
$CuCl_2$ × 2 H_2O 0.01 g
$NiCl_2$ × 6 H_2O 0.02 g
Na_2MoO_4 × 2 H_2O 0.03 g
Distilled water 1000.0 ml

343. *HALOMONAS* MEDIUM
NaCl 80.0 g
Casamino acids 7.5 g

Proteose peptone 5.0 g
Yeast extract 1.0 g
Sodium citrate 3.0 g
$MgSO_4 \times 7\ H_2O$ 20.0 g
K_2HPO_4 0.5 g
$Fe(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 0.05 g
Distilled water 1000.0 ml
Adjust pH to 7.0 with KOH.
Autoclave at 121°C for 15 min.

344. COLUMBIA AGAR
Special mixture of peptones 23.0 g
Starch 1.0 g
NaCl 5.0 г
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.3±0.2.
Adjust pH to 7.3±0.2. Autoclave at 121°C for 15 min.

345. *NATRONOSPIRILLUM SPERANDUS* MEDIUM
NaCl 34.0 g
$NaHCO_3$ 20.0 g
K_2HPO_4 0.3 g
$MgCl_2 \times 6\ H_2O$ 0.12 g
$CaCl_2 \times 2\ H_2O$ 0.03 g
Casamino acids 3.0 g
Yeast extract 0.1 g
Agar 20.0 g
Trace element solution (see below) 10.0 ml
Distilled water 1000.0 ml. Autoclave at 121°C for 15 min.
Final pH 9.0 – 9.5
Trace element solution:
$FeSO_4 \times 7\ H_2O$ 0.6 mg
$CoCl_2 \times 6\ H_2O$ 0.12 mg
$Ni(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 0.9 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$ZnSO_4 \times 7\ H_2O$ 0.14 mg
H_3BO_3 0.03 mg
$AlK(SO_4)_2 \times 12\ H_2O$ 0.24 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.02 mg
$Na_2WO_4 \times 2\ H_2O$ 0.03 mg
Na_2SeO_3 0.02 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
Distilled water 1000.0 ml
Autoclave the trace element solution and $NaHCO_3$ separately at 121°C for 15 min and add to the medium.
Final pH 8.7 – 8.9

346. *THERMAEROBACTER BAIKALENSIS* MEDIUM
Peptone 1.25 g
Yeast extract 0.25 g
Fe(III) citrate 0.025 g
NaCl 5.0 g
$MgCl_2 \times 6\ H_2O$ 1.0 g

Na_2SO_4 0.8 g
$CaCl_2 \times 2\ H_2O$ 0.45 g
KCl 0.1 g
$NaHCO_3$ 0.4 g
KBr 0.02 g
$SrCl_2 \times 6\ H_2O$ 0.03 g
H_3BO_3 0.02 g
Agar 20.0 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml. Autoclave at 121°C for 15 min.
Final pH 7.0
Trace element solution:
Na-silicate 4.0 g
NaF 2.4 g
NH_4NO_3 1.6 g
Na_2HPO_4 8.0 g
Distilled water 1000.0 ml. Autoclave the trace element solution separately at 121°C for 15 min and add to the medium.

347. SUCCINATE MINIMAL SALT MEDIUM (SMS)
EDTA 0.01 g
KH_2PO_4 0.6 g
K_2HPO_4 0.9 g
NH_4Cl 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$CaCl_2 \times 6\ H_2O$ 0.075 g
Na-succinate 2.2 g
Yeast extract 0.1 g
Trace elements solution (see below) 2.0 ml
Vitamin solution (see below) 2.0 ml
Distilled water 1000.0 ml
Trace elements solution:
$FeSO_4 \times 7\ H_2O$ 300.0 mg
$ZnSO_4 \times 7\ H_2O$ 5.0 mg
$MnCl_2 \times 4\ H_2O$ 3.0 mg
H_3BO_3 2.0 mg
$CoCl_2 \times 6\ H_2O$ 5.0 mg
$CuCl_2 \times 2\ H_2O$ 1.0 mg
$NiCl_2 \times 6\ H_2O$ 2.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 3.0 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 80.0 mg
Thiamine-HCl × 2 H2O 400.0 mg
Nicotinic acid 400.0 mg
Vitamin B_{12} 20.0 µg
Distilled water 1000.0 ml
Adjust pH to 6.8. Prepare the medium without the vitamin solution. Autoclave at 121°C for 15 min and add the vitamin solution from a filter-sterilized stock solution.

348. RO (RICH ORGANIC) MEDIUM
$MgSO_4 \times 7\ H_2O$ 0.3 g
KH_2PO_4 0.3 g
NH_4Cl 0.1 g

$CaCl_2 \times 2\ H_2O$ 1.0 g
Na-acetate $\times 3\ H_2O$ 1.0 g
Yeast Extract 0.5 g
Peptone 0.5 g
Casamino Acid 0.5 g
Trace elements solution (see below) 2.0 ml
Vitamin solution (see below) 2.0 ml
Distilled water 1000.0 ml
Trace elements solution:
$FeSO_4 \times 7\ H_2O$ 300.0 mg
$ZnSO_4 \times 7\ H_2O$ 5.0 mg
$MnCl_2 \times 4\ H_2O$ 3.0 mg
H_3BO_3 2.0 mg
$CoCl_2 \times 6\ H_2O$ 5.0 mg
$CuCl_2 \times 2\ H_2O$ 1.0 mg
$NiCl_2 \times 6\ H_2O$ 2.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 3.0 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 80.0 mg
Thiamine-HCl $\times 2\ H_2O$ 400.0 mg
Nicotinic acid 400.0 mg
Vitamin B_{12} 20.0 µg
Distilled water 1000.0 ml
Autoclave base medium, KH_2PO_4 (in 10.0 ml distilled water) and trace element solution at 121°C for 15 min. Vitamin solution sterilize by filtration.

349. *TAUTONGIA SOCIABILIS* MEDIUM
KH_2PO_4 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
NH_4Cl 0.33 g
KCl 0.33 g
Xylose or trehalose 1.0 g
Trace element solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
Autoclave base medium, KH_2PO_4 (in 10.0 ml distilled water) and trace element solution at 121°C for 15 min. Vitamin solution sterilize by filtration. Adjust pH to 7.5-7.7.
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (*Mohr's* salt) 784.0 mg
HCl (concentrated) 5.0 ml
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2SO_4NiSO_4 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Distilled water 995.0 ml
Mohr's salt is dissolved firstly in concentrated HCl, then is mixed with 1000.0 ml distilled water and other salts are dissolved in the sequence indicated.

Vitamin solution:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 100.0 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitlamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
Adjust pH to 5.9.
After autoclaving at 121°C for 15 min add sterile stock solution NaOH (0.5 M, 3.2 ml/l medium) to readjust pH to 6.8. Add the vitamin solution and trace element solution from sterile stock solutions.

350. *THERMOGEMMATA POLYSACCHARIDOLYTICA* MEDIUM
KH_2PO_4 0.165 g
$MgCl_2 \times 6\ H_2O$ 0. 165 g
$CaCl_2 \times 2\ H_2O$ 0. 165 g
NH_4Cl 0. 165 g
KCl 0. 165 g
Maltose or trehalose 1.0 g
Trace element solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (*Mohr's* salt) 784.0 mg
HCl (concentrated) 5.0 ml
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Distilled water 995.0 ml
Mohr's salt is dissolved firstly in concentrated HCl, then is mixed with distilled water and other salts are dissolved in the sequence indicated.
Vitamin solution:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 100.0 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml

Autoclave base medium, KH_2PO_4 (in 10.0 ml distilled water) and trace element solution at 121°C for 15 min. Vitamin solution sterilize by filtration. Adjust pH to 7.0-7.5.

351. *PSEUDOALTEROMONAS SPIRALIS* MEDIUM
$MgSO_4 \times 7\ H_2O$ 0.5 g
KH_2PO_4 0.3 g
NH_4Cl 0.3 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Na-acetate $\times 3\ H_2O$ 1.0 g
Yeast extract 0.5 g
Casamino acids 0.5 g
NaCl 15.0 g
Trace elements solution (see below) 2.0 ml
Vitamin solution (see below) 2.0 ml
Distilled water 1000.0 ml
Trace elements solution:
$MnCl_2 \times 4\ H_2O$ 0.3 g
$FeSO_4 \times 7\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 80 mg
Thiamine-HCl 400.0 mg
Nicotinic acid 400.0 mg
Vitamin B_{12} 20.0 µg
Distilled water 1000.0 ml
After autoclaving at 121°C for 15 min adjust to pH 7.8 with $NaHCO_3$. Add the vitamin solution and trace elements solution from sterile stock solutions.

352. *THERMUS* MEDIUM
Bacto Yeast Extract (Difco) 1.0 g
Bacto Tryptone (Difco) 1.0 g
Na- glutamate $\times H_2O$ 1.0 g
$CaSO_4 \times 2\ H_2O$ 0.06 g
$MgSO_4 \times 7$ H2O 0.1 g
NaCl 0.08 g
KNO_3 0.1 g
$NaNO_3$ 0.69 g
Na_2HPO_4 0.11 g
Trace element solution (see below) 10.0 ml
Agar, if necessary 20.0 g
Distilled water to 1000.0 ml
Adjust pH to 7.5 with NaOH. Autoclave at 121°C for 15 min.
Trace elements solution:
Nitrilotriacetic acid 12.8 g
$FeCl_2 \times 4\ H_2O$ 1.35 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$CoCl_2 \times 6\ H_2O$ 0.024 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2$ 0.025 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.024 g
$NiCl_2 \times 6\ H_2O$ 0.12 g
$Na_2SeO_3 \times 5\ H_2O$ 0.04 g

Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with NaOH, and then add minerals. Final pH 7.0.

353. ALCALIPHILIC *AMPHIBACILLUS* MEDIUM
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 0.5 g
KCl 0.2 g
Na_2CO_3 63.6 g
$NaHCO_3$ 50.4 g
$Na_2S \times 9\ H_2O$ 0.7 g
Yeast extract 0.2 g
Sucrose 5.0 g
Trace elements (see below) 1.0 ml
Vitamin solution (see below) 10.0 ml
Resazurin 0.01 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Final pH 9.5-10.0. Prepare the medium without adding the vitamins, sucrose, yeast extract, NH_4Cl, Na_2CO_3, and $NaHCO_3$ using anaerobic conditions, under nitrogen. If the medium has been boiled to remove oxygen add the NH_4Cl, Na_2CO_3, and $NaHCO_3$ after the medium had cooled. Dispense into tubes stopper with rubber stoppers (serum tubes or bottles, or screw capped tubes). Autoclave, and to the cooled medium add the vitamins, sucrose, yeast extract, and $Na_2S \times 9\ H_2O$ from anaerobic, sterile

stock solutions.

354. BACTO MARINE BROTH (DIFCO 2216)
Bacto peptone 5.0 g
Bacto yeast extract 1.0 g
Fe(III) citrate 0.1 g
NaCl 80.0 g
$MgCl_2$ (anhydrous) 5.9 g
Na_2SO_4 3.24 g
$CaCl_2 \times 2\ H_2O$ 1.8 g
KCl 0.55 g
$NaHCO_3$ 0.16 g
KBr 0.08 g
$SrCl_2$ 34.0 mg
H_3BO_3 22.0 mg
Na-silicate 4.0 mg
NaF 2.4 mg
NH_4NO_3 1.6 mg
Na_2HPO_4 8.0 mg
Distilled water 1000.0 ml C.
Final pH should be 7.6 ± 0.2 at 25
If using the complete medium from Difco add 37.4 g per liter water + 6% NaCl.

355. *CLOSTRIDIUM* PYG MEDIUM
Trypticase peptone 5.0 g
Peptone from meat (pepsin-digested) 5.0 g
Yeast extract 10.0 g
Salt solution (see below) 40.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
L-Cysteine-HCl $\times\ H_2O$ 0.5 g
Na_2CO_3 2.5 g
D-Glucose 5.0 g
Distilled water 1000.0 ml
Salt solution:
$CaCl_2 \times 2\ H_2O$ 0.25 g
$MgSO_4 \times 7\ H_2O$ 0.5 g
K_2HPO_4 1.0 g
KH_2PO_4 1.0 g
$NaHCO_3$ 10.0 g
NaCl 2.0 g
Distilled water 1000.0 ml
Dissolve ingredients (except cysteine, carbonate and glucose) and sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 - 45 min to make it anoxic. Add cysteine, then dispense under 80% N_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add glucose from a sterile anoxic stock solution prepared under 100% N_2 gas atmosphere and carbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas atmosphere. Adjust pH of complete medium to 7.0, if necessary.

356. *ANOYXNATRONUM* MEDIUM
Na_2CO_3 25.0 g
$NaHCO_3$ 25.0 g
KCl 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
NH_4Cl 0.5 g

K_2HPO_4 0.2 g
Yeast extract 0.2 g
Trace elements *SL-10* (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
$Na_2S \times 9\ H_2O$ 0.7 g
Glucose 5.0 g
Distilled water 1000.0 ml, pH 9.0
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Prepare the medium anaerobically without the vitamins, $Na_2S \times 9\ H_2O$, yeast extract, $NaHCO_3$, and Na_2CO_3. Boil the medium, cool under N_2, add the $NaHCO_3$, and Na_2CO_3, dispense under N_2 and autoclave the medium. Add the vitamin solution, yeast extract, $Na_2S \times 9\ H_2O$ and glucose from sterile stock solution prepared under N_2 to the cooled, autoclaved medium.

357. *THERMOLITHOBACTER* MEDIUM
KCl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.52 g
$CaCl_2 \times 2\ H_2O$ 0.29 g
NH_4Cl 0.33 g
KH_2PO4 0.33 g
Trace element solution *SL-11* (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 1.0 g
Yeast extract 0.05 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.7 g
Distilled water 1000.0 ml
Trace element solution SL-11:
Na_2-EDTA $\times 2\ H_2O$ 5.2 g
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg

$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 1000.0 ml
Dissolve EDTA in 800 ml distilled water, adjust pH to 7 using 2 N NaOH and add ferrous chloride. After ferrous chloride has dissolved add other compounds. Finally adjust pH to 6.0 and bring volume to 1000.0 ml.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, yeast extract, vitamins and sulfide, then sparge medium with 100% N_2 gas for 30 - 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add yeast extract, vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas atmosphere and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. After completing the medium adjust pH to 6.8-7.0. Inoculated vessels are pressurized with sterile carbon monoxide gas to 2 bar overpressure.

358. *THERMOANAEROBACTERIUM* MEDIUM
KH_2PO_4 0.3 g
$Na_2HPO_4 \times 12\ H_2O$ 5.3 g
NH_4Cl 1.0 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
Trace elements solution (see below) 10.0 ml
$FeSO_4 \times 7\ H_2O$ solution (0.1% w/v in 0.1 N H_2SO_4) 1.5 ml
Yeast extract 1.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
D-Glucose 5.0 g
Vitamin solution (see below) 5.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid (NTA) 12.8 g
$FeCl_2 \times 4\ H_2O$ 0.2 g
$MnCl_2 \times 4\ H_2O$ 0.1 g
$CoCl_2 \times 6\ H_2O$ 0.17 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnCl_2$ 0.1 g
$CuCl_2 \times 2\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
NaCl 1.0 g
$Na_2SeO_3 \times 5\ H_2O$ 0.03 g

First dissolve NTA in 200 ml of distilled water and adjust pH to 6.5 with KOH, then dissolve mineral salts. Finally adjust pH to 6.5 with KOH and make up to 1000.0 ml.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except glucose, vitamins and sulfide), adjust pH to 6.0, sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Dispense under same gas atmosphere into Hungate-type tubes or serum vials and autoclave. After sterilization add glucose and sulfide from anoxic stock solutions autoclaved under 100% N_2 gas and vitamins from a filter-sterilized anoxic stock solution prepared under 100% N_2. Adjust pH of complete medium to 6.0 – 6.5, if necessary.

359. *DESULFOVERMICULUS* MEDIUM
NaCl 100.0 g
$MgSO_4$ × 7 H_2O 10.0 g
KCl 6.0 g
$CaCl_2$ × 2 H_2O 0.4 g
NH_4Cl 1.0 g
KH_2PO_4 0.1 g
Yeast extract 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
$NaHCO_3$ 4.0 g
Na-(DL)-malate 1.0 g
Resazurin 0.5 mg
Na_2S × 9 H_2O 0.3 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2$ × 4 H_2O 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2$ × 4 H_2O 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2$ × 6 H_2O 190.0 mg
$CuCl_2$ × 2 H_2O 2.0 mg
$NiCl_2$ × 6 H_2O 24.0 mg
Na_2MoO_4 × 2 H_2O 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
Na_2SeO_3 × 5 H_2O 3 mg
Na_2WO_4 × 2 H_2O 4 mg
Distilled water 1000.0 ml
Dissolve ingredients (except lactate, bicarbonate and sulfide), boil medium for 1 min, then cool to room temperature under 80% N_2 and 20% CO_2 gas mixture. Dispense under same gas atmosphere in culture vessels and autoclave at 121°C 15 min. Add sodium lactate and sulfide from sterile anoxic

stock solutions prepared under N_2 and bicarbonate from a sterile stock solution prepared under 80% N_2 and 20% CO_2 (all solutions sterilize separately at 121°C 15 min).
Final pH of the medium 7.0-7.2.

360. *METHANOSARCINA* MEDIUM
NaCl 5.0 g
$MgCl_2 \times 6\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
NH_4Cl 1.0 g
Casamino acids 1.0 g
Resazurin 0.01 g
Methanol 10% 10.0 ml
Trace element solution (see below) 10.0 ml
Vitamin solution (see below) 5.0 ml
L-Cysteine chloride $\times H_2O$ 0.5 g
Distilled water 965.0 ml
Buffer solutions:
a) K_2HPO_4 29.0 g
Distilled water 100.0 ml
b) KH_2PO_4 15.0 g
Distilled water 100.0 ml
Trace element solution:
Nitrilotriacetic acid 12.8 mg
$FeSO_4 \times 7\ H_2O$ 0.1 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$CoCl_2 \times 2\ H_2O$ 0.17 mg
$CaCl_2 \times 2\ H_2O$ 0.1 mg
$ZnCl_2$ 0.1 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
H_3BO_3 0.01 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.01 mg
NaCl 1.0 mg
Na_2SeO_4 0.017 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4
Prepare medium in anaerobic conditions, blowing through with N_2 without O_2 up to sterilization. Solutions of buffer (per 1 ml) add to base medium after separate sterilization. Base medium, trace element and buffer solutions autoclave at 121°C for 15 min. Vitamin solution is filter sterilized.

361. *METHANOBACTERIUM ARCTICUM* MEDIUM
Solution 1:
KCl 0.34 g

$MgCl_2 \times 6\ H_2O$ 0.4 g
$MgSO_4 \times 7\ H_2O$ 0.35 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
NH_4Cl 0.25 g
$KH_2\ PO_4$ 0.14 g
NaCl 5.0 g
Resazurin 0.01 g
$NaHCO_3$ 5.0 g
Trace element solution (see below) 10.0 ml
Distilled water 965.0 ml
Solution 2 (reducing agents):
L-Cysteine chloride $\times H_2O$ 0.5 g
$Na_2S \times 9\ H_2O$ 0. 5 g
Distilled water 10.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times 7\ H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4$ 0.18 g
$CuSO_4$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.025 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
Distilled water 1000.0 ml
pH 7.0-7.4.
Prepare medium in anaerobic conditions, blowing through with N_2 without O_2 up to sterilization. Solutions of reducing agents (10.0 ml) and others solutions add to base medium after separate sterilization at 121°C for 15 min. Sterilize vitamin solution by filtration. Cultivate in a gas mixture of 80% H_2 and 20% CO_2.

362. *GEOALKALIBACTER* MEDIUM
NH_4Cl 0.5 g
KCl 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
KH_2PO_4 0.2 g
NaCl 1.0 g
Yeast extract 0.1 g
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Na_2CO_3 3.0 g
$NaHCO_3$ 10.0 g
Sulfur, powdered 10.0 g
Na-acetate $\times 3\ H_2O$ 2.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g

$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3.0 mg
$Na_2WO_4 \times 2\ H_2O$ 4.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except carbonates, sulfur and acetate), then sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Add solid carbonate and bicarbonate, adjust pH to 9.0 - 9.2, dispense under 100% N_2 gas atmosphere into anoxic Hungate type tubes or serum vials containing already the appropriate amount of sulfur. Sterilize medium by heating cultivation vessels in a water bath to 90 – 100°C for 1 – 2 hours on each of 3 successive days. Add acetate from a sterile anoxic stock solution prepared under 100% N_2 gas.

363. *ANOXYBACILLUS* MEDIUM
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
KCl 0.2 g
NH_4Cl 1.0 g
NaCl 5.0 g
Trace element solution *SL-10* (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Na_2CO_3 2.76 g
$NaHCO_3$ 10.0 g
Yeast extract 0.5 g
D-Glucose 5.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg

Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve all ingredients except carbonates, yeast extract, glucose, vitamins and sulfide, then sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Add carbonate and hydrogencarbonate, adjust pH to 9.0 - 9.5, dispense medium under 100% N_2 gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add yeast extract, glucose, vitamins and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. Vitamins should be sterilized by filtration. Adjust pH of complete medium to 9.5 – 9.7.

364. *CALDANAEROBACTER* MEDIUM
KCl 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.52 g
$CaCl_2 \times 2\ H_2O$ 0.29 g
NH_4Cl 0.33 g
KH_2PO_4 0.33 g
Trace element solution *SL-4* (see below) 10.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 2.5 g
D-glucose 2.0 g
Yeast extract 0.05 g
Vitamin solution 1 (see below) 9.0 ml
Seven vitamins solution (see below) 1.0 ml
$Na_2S \times 9\ H_2O$ 0.3 g
Distilled water 1000.0 ml
Trace element solution SL-4:
Na_2-EDTA 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.2 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$MnCl_2 \times 4\ H_2O$ 0.03 g
H_3BO_3 0.3 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
$CuCl_2 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$Na_2MoO_4 \times 2\ H_2O$ 0.03 g
Distilled water 1000.0 ml
First dissolve EDTA in distilled water and adjust pH to 7.0 using 2 N NaOH; then add other compounds.
Vitamin solution 1:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Seven vitamins solution:
Vitamin B_{12} 100.0 mg
p-Aminobenzoic acid 80.0 mg

D(+)-Biotin 20.0 mg
Nicotinic acid 200.0 mg
D-Ca-pantothenate 100.0 mg
Pyridoxine-HCl 300.0 mg
Thiamine-HCl × 2 H_2O 200.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except bicarbonate, D-glucose, yeast extract, vitamins and sulfide, then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30-45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave.
Add yeast extract, vitamins and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas atmosphere and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Stock solutions of pyruvate and vitamins are sterilized by filtration. After completing the medium adjust pH to 6.8-7.0 with a sterile anoxic stock solution of Na_2CO_3 (5% w/v), if necessary.

365. *THERMOANAEROBACTER* MEDIUM II
NH_4Cl 1.0 g
NaCl 0.1 g
$MgCl_2$ × 6 H_2O 0.1 g
$CaCl_2$ × 2 H_2O 0.05 g
K_2HPO_4 × 3 H_2O 0.4 g
Trace element solution (see below) 10.0 ml
Yeast extract 0.75 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 2.6 g
Cellobiose 4.0 g
Vitamin solution (see below) 10.0 ml
Na_2S × 9 H_2O 0.25 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4$ × 7 H_2O 3.0 g
$MnSO_4$ × H_2O 0.5 g
NaCl 1.0 g
$FeSO_4$ × 7 H_2O 0.1 g
$CoSO_4$ × 7 H_2O 0.18 g
$CaCl_2$ × 2 H_2O 0.1 g
$ZnSO_4$ × 7 H_2O 0.18 g
$CuSO_4$ × 5 H_2O 0.01 g
$KAl(SO_4)_2$ × 12 H_2O 0.02 g
H_3BO_3 0.01 g
Na_2MoO_4 × 2 H_2O 0.01 g
$NiCl_2$ × 6 H_2O 0.03 g
Na_2SeO_3 × 5 H_2O 0.3 mg
Na_2WO_4 × 2 H_2O 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl × 2 H_2O 5.0 mg
Riboflavin 5.0 mg

Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except bicarbonate, cellobiose, vitamins and sulfide), then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Dispense under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After sterilization add cellobiose, vitamins and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas mixture. Stock solutions of cellobiose and vitamins should be sterilized by filtration. Adjust pH of complete medium to 7.0, if necessary.

366. *DESULFUROCOCCUS KAMCHATKENSIS* MEDIUM
NH_4Cl 0.33 g
KH_2PO4 0.33 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.44 g
$MgCl_2 \times 6\ H_2O$ 0.7 g
NaCl 0.5 g
Trace element solution *SL-10* (see below) 1.0 ml
Yeast extract (OXOID) 0.2 g
Na-resazurin solution (0.1% w/v) 0.5 ml
Sulfur, powdered 10.0 g
D-Glucose 2.5 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times$ 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except sulfur, glucose, vitamins and sulfide), then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 – 45 min to make it anoxic. Adjust pH to 6.2 - 6.4 and dispense

medium under 80% N_2 and 20% CO_2 gas atmosphere into anoxic Hungate-type tubes or serum vials containing already the appropriate amount of sulfur. Sterilize medium by heating cultivation vessels in a boiling water bath for 2 - 3 hours on each of 3 successive days. After sterilization add glucose, vitamins and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas atmosphere. Vitamins are sterilized by filtration. Adjust pH of complete medium to 6.5, if necessary.

367. *ANAEROBRANCA* MEDIUM

KH_2PO_4 0.5 g
$Na_2HPO_4 \times 2\ H_2O$ 3.9 g
KCl 0.5 g
Yeast extract 5.0 g
Trace element solution (see below) 5.0 ml
Na_2-fumarate 1.5 g
Vitamin solution (see below) 10.0 ml
L-Cysteine-HCl $\times\ H_2O$ 0.15 g
$Na_2S \times 9\ H_2O$ 0.15 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times\ 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except fumarate, vitamins, cysteine and sulfide), adjust pH to 8.5 and sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After sterilization add fumarate, vitamins, cysteine and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. Stock solutions of fumarate and vitamins are sterilized by filtration. Adjust pH of complete medium to 8.5, if necessary.

368. *METHANOBACTERIUM VETERUM* MEDIUM

Solution 1:

Na-acetate × 3 H_2O 0.5 g
$(NH_4)_2SO_4$ 0.45 g
K_2HPO_4 0.29 g
KH_2PO_4 0.18 g
$MgSO_4$ × 7 H_2O 0.12g
$CaCl_2$ × 2 H_2O 0.06 g
NaCl 0.05
Resazurin 0.01 g
Na_2CO_3 5.0 g
Trace element solution (see below) 10.0 ml
Vitamin solution (see below) 10.0 ml
Distilled water 965.0 ml

Solution 2 (reducing agents):

L-Cysteine-HCl × H_2O 0.5 g
Na_2S × 9 H_2O 0. 5 g
Distilled water 10.0 ml

Trace element solution:

Nitrilotriacetic acid 1.5 g
$MgSO_4$ × 7 H_2O 3.0 g
$MnSO_4$ × 7 H_2O 0.5 g
NaCl 1.0 g
$FeSO_4$ × 7 H_2O 0.1 g
$CoSO_4$ 0.18 g
$CaCl_2$ × 2 H_2O 0.1 g
$ZnSO_4$ 0.18 g
$CuSO_4$ 0.01 g
$KAl(SO_4)_2$ × 12 H_2O 0.02 g
H_3BO_3 0.01 g
Na_2MoO_4 × 2 H_2O 0.01 g
$NiCl_2$ 0.025 g
Na_2SeO_3 0.3 mg
Distilled water 1000.0 ml
pH 7.0-7.4

Vitamin solution:

Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic (tioctoic) acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4

Prepare medium in anaerobic conditions, blowing through with N_2 without O_2 up to sterilization. Solutions of reducing agents (10.0 ml) and others solutions add to base medium after separate sterilization at 121°C for 15 min. Sterilize vitamin solution by filtration.
Cultivate in a gas mixture of 80% H_2 and 20% CO_2.

369. *CLOSTRIDIUM TEPIDIPROFUNDI* MEDIUM
NaCl 18.0 g
$MgCl_2 \times 6\ H_2O$ 4.0 g
KCl 0.34 g
NH_4Cl 0.25 g
$CaCl_2$ 0.11 g
K_2HPO_4 0.18 g
$Fe(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 20.0 mg
Trace element solution *SL-10* (see below) 1.0 ml
Selenite-tungstate solution (see below) 1.0 ml
Yeast extract 0.2 g
Proteose peptone 10.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
$NaHCO_3$ 5.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.5 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Selenite-tungstate solution:
NaOH 0.5 g
$Na_2SeO_3 \times 5\ H_2O$ 3 mg
$Na_2WO_4 \times 2\ H_2O$ 4 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients (except bicarbonate, vitamins and sulfide), then sparge medium with 80% N_2 and 20% CO_2 gas mixture for 30 - 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Add vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas and bicarbonate from a sterile anoxic stock solution prepared under 80% N_2 and 20% CO_2 gas atmosphere. The pH of the complete medium should be 6.5 - 7.0.

370. *ACIDILOBUS* MEDIUM
NH_4Cl 0.33 g

KCl 0.33 g
KH_2PO_4 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
Trace mineral solution *SL-10* (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Sulfur, powdered 10.0 g
Yeast extract 0.1 g
D-glucose 2.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.45 g
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Dissolve ingredients except D-glucose, sulfur, yeast extract, vitamins and sulfide. Adjust pH to 3.5 with H_2SO_4 and sparge medium with 100% CO_2 gas for 30 – 45 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials containing the appropriate amount of sulfur. Heat vessels containing medium to 90°C for 1 hour on each of 3 successive days. Add yeast extract, vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. The pH of the complete medium should be at 3.5 - 3.8.

371. MINERAL MEDIUM “P” FOR METHANOTROPHIC BACTERIA
$Na_2HPO_4 \times 12\ H_2O$ 1.5 g
KH_2PO_4 0.7 g
KNO_3 1.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
NaCl 30.0 g
$NaHCO_3$ 4.2 g
Na_2CO_3 0.05 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace elements solution:

EDTA 5.0 g
$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
Prepare the medium without the $NaHCO_3$ and Na_2CO_3. Basal medium, trace element solution, $NaHCO_3$ and Na_2CO_3 sterilize separately at 121°C for 15 min. When preparing liquid media cool the mineral salts solution, $NaHCO_3$ and Na_2CO_3 to room temperature before mixing. When preparing agar add 2.0 % agar to the mineral salt solution and autoclave. Cool the $NaHCO_3$ and Na_2CO_3 stock solution and agar to 50-55°C before mixing.
The pH of the complete medium should be at 9.0.

372. PLATE COUNT AGAR WITH 1% NaCl
Tryptone 5.0 g
Yeast extract 2.5 g
Glucose 1.0 g
NaCl 10.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.0±0.2
Autoclave at 121°C for 15 min.

373. MARINE AMMONIUM MINERAL SALTS
Solution A:
NaCl 20.0 g
$(NH_4)_2SO_4$ 1.0 g
$CaCl_2 \times 2\ H_2O$ 0.2 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.0 2 g
$Na_2WO4 \times 2\ H_2O$ 0.0 3 g
$Na_2MoO_4 \times 2\ H_2O$ 0.02 g
Methanol 5.0 ml
Trace element solution SL-10 (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 900.0 ml
Adjust the pH to 7.2 if needed with NaOH/HCl
Solution B:
KH_2PO_4 0.36 g
K_2HPO_4 2.34 g
Distilled water 100.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml

Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Autoclave solution A, B and trace element solution separately at 121°C for 15 min and combine after cooling. Add filter sterilize methanol and vitamin solution.

374. AMS MEDIUM
Phoshate buffer:
KH_2PO_4 0.54 g
K_2HPO_4 0.7 g
Agar (if needed) 15.0 g
Distilled water 600.0 ml
Salt solution:
NH_4Cl 0.5 g
$CaCl_2 \times 2\ H_2O$ 0.2 g
$MgSO_4 \times 7\ H_2O$ 1.0 g
$FeSO_4$ solution (see below) 80 µl
Trace element solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 400.0 ml
$FeSO_4$ solution:
$FeSO_4 \times 7\ H_2O$ 0.5 g
HCl (5 M) few drops
Distilled water 10.0 ml
Trace element solution
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 60.0 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 10.0 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Distilled water 100.0 ml
Autoclave phoshate buffer, salt solution and trace element solution separately at 121°C for 15 min and mix before use. Add filter sterilize $FeSO_4$ solution and vitamin solution.
pH 6.8.

375. *METHYLOMICROBIUM BURYATENSE* MEDIUM

$KH_2PO_4 \times 12\ H_2O$ 0.5 g
KNO_3 0.5 g
$MgSO_4 \times 7\ H_2O$ 0.4 g
NaCl 5.0 g
$NaHCO_3$ (1M) 25.0 ml
Na_2CO_3 (1M) 5.0 ml
Distilled water 1000.0 ml
pH 9.0–9.5
Trace element solution (see below) 1 ml
Trace elements solution:
EDTA 5.0 g
$CuCl_2 \times 2\ H_2O$ 0.1 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
$NiCl_2 \times 6\ H_2O$ 0.02 g
$CoCl_2 \times 6\ H_2O$ 0.2 g
Na_2MoO_4 0.03 g
Distilled water 1000.0 ml
Prepare the medium without the $NaHCO_3$ and Na_2CO_3. Basal medium, trace element, $NaHCO_3$ (1M) and Na_2CO_3 (1M) sterilize separately at 121°C 15 min. When preparing liquid media cool the mineral salts solution, $NaHCO_3$ and Na_2CO_3 solutions to room temperature before mixing. When preparing agar add 2.0 % agar to the mineral salt solution and autoclave. Cool $NaHCO_3$ and Na_2CO_3 stock solutions and agar to 50-55°C before mixing.

376. MINERAL MEDIUM WITH GELATIN
NaCl 10.0 g
KH_2PO_4 0.14 g
KCl 0.36 g
$MgCl_2 \times 6\ H_2O$ 0.4 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
NH_4Cl 0.25 g
3–(*N*–Morpholino) propanesulfonic acid (MOPS) buffer 2.09 g
Gelatin 1.0 g
Distilled water 1000.0 ml
Adjust the pH to 7.5 if needed with NaOH/HCl. Autoclave at 121°C for 15 min.

377. *CHLOROFLEXUS* MEDIUM
KH_2PO_4 0.5 g
NH_4Cl 0.5 g
$MgCl_2$ 0.3 g
KCl 0.5 g
NaCl 5.0 g
$Na_2S_2O_3 \times 5\ H_2O$ 0.1 g
Yeast extract 1.0 g
Na-acetate $\times 3\ H_2O$ 0.5 g
Na-malate 0.5 g
HEPES 3.0 g
Trace element solution according to *Pfennig* (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution according to Pfennig:
EDTA 1.5 g
Trace element solution according to *Hogland* (see below) 6.0 ml
$FeSO_4 \times 7\ H_2O$ 0.2 g

$MnCl_2 \times 4\ H_2O$ 0.02 g
$ZnSO_4 \times 7\ H_2O$ 0.1 g
Distilled water 1000.0 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.5 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 100.0 ml
After autoclaving at 121°C for 15 min, add 1 ml of 5% $Na_2S \times 9\ H_2O$ solution (autoclaved), 1 ml of 5% $CaCl_2 \times 2\ H_2O$ solution (autoclaved) and 10 ml of 3% $NaHCO_3$ solution (filter-sterilized). Vitamin solution is filter sterilized. Adjust pH to 7.5.

378. *POLYMORPHOSOMA TUNDRAE* MEDIUM
$MgSO_4 \times 7\ H_2O$ 0.8 g
NH_4NO_3 0.1 g
KH_2PO_4 0.04 g
$CaCl_2 \times 2\ H_2O$ 0.02 g
Fructose 0.5 g
Yeast extract 0.01 g
Pectin 0.05 g
Phytagel 9.0 g
Distilled water 1000.0 ml
Adjust to pH 4.9 – 5.5. Autoclave at 121°C for 15 min.

379. *GRANULICELLA SIBIRICA* MEDIUM
$MgSO_4 \times 7\ H_2O$ 0.05 g
NH_4NO_3 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Glucose 0.5 g
Yeast extract 0.25 g
Staley's vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
Adjust pH to 5.0-5.5
Staley´s Vitamin Solution:
Vitamin B_{12} 0.1 mg
Biotin 2.0 mg

Thiamine-HCl × 2 H_2O 5.0 mg
Ca-pantothenate 5.0 mg
Folic acid 2.0 mg
Riboflavin 5.0 mg
Nicotinamide 5.0 mg
p-Aminobenzoic acid 5.0 mg
Pyridoxine hydrochloride 10.0 mg
Distilled water 1000.0 ml.
Autoclave at 121°C 15 min. Add filter-sterilized vitamin solution.

380. *LIMNOGLOBUS ROSEUS* MEDIUM
Peptone 0.1 g
Yeast extract 0.25 g
NH_4NO_3 0.1 g
Glucose 0.5 g
*Hutner'*s basal salts 20.0 ml
Staley's vitamin solution, double concentration (see below) 1.0 ml
Phytagel 10.0 g
Distilled water 1000.0 ml
Adjust pH to 6.5.
Hutner's basal salts
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4$ × 7 H_2O 29.7 g
$CaCl_2$ × 2 H_2O 3.34 g
Na_2MoO_4 × 2 H_2O 12.67 mg
$FeSO_4$ × 7 H_2O 99.0 mg
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water.
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4$ × 7 H_2O 1095.0 mg
$FeSO_4$ × 7 H_2O 500.0 mg
$MnSO_4$ × 7 H_2O 154.0 mg
$CuSO_4$ × 5 H_2O 39.0 mg
$Co(NO_3)_2$ × 6 H_2O 24.8 mg
$Na_2B_4O_7$ × 10 H_2O 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Staley´s vitamin solution, double concentration:
Vitamin B_{12} 0.2 mg
Biotin 4.0 mg
Thiamine-HCl × 2 H_2O 10.0 mg
Ca-pantothenate 10.0 mg
Folic acid 4.0 mg
Riboflavin 10.0 mg
Nicotinamide 10.0 mg
p-Aminobenzoic acid 10.0 mg
Pyridoxine hydrochloride 20.0 mg
Distilled water 1000.0 ml.
Autoclave at 121°C 15 min. Add filter-sterilized vitamin solution.

381. *ALKALICAULIS SATELLES* MEDIUM
NaCl 42.0 g
$NaHCO_3$ 24.0 g
KH_2PO_4 0.3 g
$MgSO_4 \times 7\ H_2O$ 0.12 g
$CaCl_2 \times 2\ H_2O$ 0.03 g
Trypton 2.0 g
Trace element solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
$FeSO_4 \times 7\ H_2O$ 0.6 mg
$CoCl_2 \times 6\ H_2O$ 0.12 mg
Ni $(NH_4)_2(SO_4)_2 \times 6\ H_2O$ 0.9 mg
$MnCl_2 \times 4\ H_2O$ 0.1 mg
$ZnSO_4 \times 7\ H_2O$ 0.14 mg
H_3BO_3 0.03 mg
$AlK(SO_4)_2 \times 12\ H_2O$ 0.24 mg
$Na_2MoO_4 \times 2\ H_2O$ 0.02 mg
$Na_2WO_4 \times 2\ H_2O$ 0.03 mg
$Na_2SeO_3 \times 5\ H_2O$ 0.02 mg
$CuCl_2 \times 2\ H_2O$ 0.02 mg
Distilled water 1000.0 ml
Prepare the medium without $NaHCO_3$. Basal medium, trace element solution and $NaHCO_3$ sterilize separately at 121°C for 15 min. When preparing liquid media cool the mineral salts solution and $NaHCO_3$ to room temperature before mixing. When preparing agar add 2.0 % agar to the mineral salt solution and autoclave. Cool the $NaHCO_3$ stock solution and agar to 50-55°C before mixing.
pH 8.0-9.0

382. *VIBRIO HARVEYI* MEDIUM
NaCl 30.0 g
$MgSO_4 \times 7\ H_2O$ 0.2 g
KH_2PO_4 1.0 g
Na_2HPO_4 6.0 g
$(NH_4)_2HPO_4$ 0.5 g
Peptone 5.0 g
Glycerol 3.0 ml
Distilled water 1000.0 ml
Autoclave at 121°C 15 min.

383. MEDIUM FOR MARINE PLANCTOMYCETES
Hutner's basal salts medium (see below) 20.0 ml
Peptone Bacto 1.0 g
Yeast extract Bacto 1.0 g
HEPES 2.38 g
Artificial seawater (see below) 250.0 ml
Distilled water 690.0 ml (less for plates)
Adjust pH to 7.5 with 5 M KOH
After autoclaving and cooling (please see below for plates) add to the medium:
Glucose solution (25%, sterile-filtered) 4.0 ml
Vitamin solution 5.0 ml
N-Acetylglucosamine 20.0 ml of 50.0 g/l stock solution
Trace element solution 1.0 ml
Artificial sea water:
NaCl 46.94 g

Na_2SO_4 7.84 g
$MgCl_2 \times 6\ H_2O$ 21.28 g
$CaCl_2 \times 2\ H_2O$ 2.86 g
$NaHCO_3$ 0.384 g
KCl 1.384 g
KBr 0.192 g
H_3BO_3 0.052 g
$SrCl_2 \times 6\ H_2O$ 0.08 g
NaF 0.0 6 g
Distilled water 1000.0 ml
Do not autoclave. Due to high salt concentration, no filtration. Sometimes precipitation after a while or fungal growth observed, thus better prepare fresh. Store at room temperature.
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01267 g
$FeSO_4 \times 7\ H_2O$ 0.099 g
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water. Sterilize by filtration, store at +4°C.
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Sterilize by filtration, store at +4°C.
Vitamin solution:
Biotin 4.0 mg
Folic acid 4.0 mg
Pyridoxine-HCl 20.0 mg
Riboflavine 10.0 mg
Thiamine-HCl × 2 H2O 10.0 mg
Nicotinamide 10.0 mg
D-Ca-pantothenate 10.0 mg
Vitamin B_{12} 0.2 mg
p-Aminobenzoic acid 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
Trace element solution:
Na-Nitrilotriacetat 1.5 g
$MnSO_4 \times H_2O$ 500.0 mg
$FeSO_4 \times 7\ H_2O$ 100.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 100.0 mg
$ZnCl_2$ 100.0 mg
$NiCl_2 \times 6\ H_2O$ 50.0 mg
H_2SeO_3 50 mg

$CuSO_4 \times 5\ H_2O$ 10.0 mg
$AlK(SO_4)_2 \times 12\ H_2O$ 10.0 mg
H_3BO_3 10.0 mg
$NaMoO_4 \times 2\ H_2O$ 10.0 mg
$Na_2WO_4 \times 2\ H_2O$ 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
For plates:
15.0 g/l Agar (Bacto) 3x washed with distilled water, autoclave separately and take volume of distilled water into account.
or
8.0 g/l Phytagel in 200.0 ml distilled water (mix before autoclaving), autoclave separately. Gelrite gets solid below 80°C after autoclaving and in general polymerization starts fast after mixing with media.

384. MEDIUM FOR LIMNIC PLANCTOMYCETES
NH_4Cl 0.53 mg
KH_2PO_4 1.4 mg
KNO_3 10 mg
$MgSO_4 \times 7\ H_2O$ 49.3 mg
$CaCl_2 \times 2\ H_2O$ 14.7 mg
$CaCO_3$ 25 mg
$NaHCO_3$ 25 mg
Peptone Bacto 1.0 g
Yeast extract Bacto 1.0 g
HEPES 2.38 g
Hutner's basal salts medium (see below) 20.0 ml
Distilled water 950 ml (less for plates)
Adjust pH to 7.0 with 5 M KOH
After autoclaving and cooling (please see below for plates) add to the medium:
Glucose solution (25%, sterile-filtered) 4.0 ml
Vitamin solution 5.0 ml
N-Acetylglucosamine 20.0 ml of 50.0 g/l stock solution
Trace element solution 1.0 ml
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01267 g
$FeSO_4 \times 7\ H_2O$ 0.099 g
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water. Sterilize by filtration, store at +4°C.
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.

Sterilize by filtration, store at +4°C.
Vitamin solution:
Biotin 4.0 mg
Folic acid 4.0 mg
Pyridoxine-HCl 20.0 mg
Riboflavine 10.0 mg
Thiamine-HCl × 2 H_2O 10.0 mg
Nicotinamide 10.0 mg
D-Ca-pantothenate 10.0 mg
Vitamin B_{12} 0.2 mg
p-Aminobenzoic acid 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
Trace element solution:
Na-Nitrilotriacetate 1.5 g
$MnSO_4$ × H_2O 500.0 mg
$FeSO_4$ × 7 H_2O 100.0 mg
$Co(NO_3)_2$ × 6 H_2O 100.0 mg
$ZnCl_2$ 100.0 mg
$NiCl_2$ × 6 H_2O 50.0 mg
H_2SeO_3 50 mg
$CuSO_4$ × 5 H_2O 10.0 mg
$AlK(SO_4)_2$ × 12 H_2O 10.0 mg
H_3BO_3 10.0 mg
$NaMoO_4$ × 2 H_2O 10.0 mg
Na_2WO_4 × 2 H_2O 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
For plates:
15.0 g/l Agar (Bacto) 3x washed with distilled water, autoclave separately and take volume of distilled water into account.
or
8.0 g/l Phytagel in 200.0 ml distilled water (mix before autoclaving), autoclave separately. Gelrite gets solid below 80°C after autoclaving and in general polymerization starts fast after mixing with media.

385. MEDIUM SM
KH_2PO_4 0.14 g
$MgCl_2$ × 6 H_2O 0.4 g
$CaCl_2$ × 2 H_2O 0.05 g
NH_4Cl 0.25 g
KCl 0.36 g
HEPES 2.38 g
Yeast extract 0.5 g
Trace elements solution (see below) 1.0 ml
Vitamin solution (see below) 1.0 ml
Distilled water 1000.0 ml
Trace element solution:
$(NH_4)_2Fe(SO_4)_2$ × 6 H_2O (Mohr's salt) 784.0 mg
HCl (concentrated) 5.0 ml
$CoCl_2$ × H_2O 238.0 mg
$(NH_4)_2Ni(SO_4)_2$ × 6 H_2O 395.0 mg
Na_2MoO_4 × 2 H_2O 24.0 mg
Na_2WO_4 × 2 H_2O 33.0 mg
$ZnSO_4$ × 7 H_2O 144.0 mg

$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Distilled water 995.0 ml
Mohr's salt is dissolved firstly in concentrated HCl, then is mixed with water and other salts are dissolved in the sequence indicated.
Vitamin solution according to Wolin et al.:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 100.0 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
Autoclave at 121°C 15 min. Add filter-sterilized vitamin solution and trace elements from sterile stock solution.

386. *SALINICOLA SALARIUS* MEDIUM
Tryptone 5.0 g
Yeast extract 2.5 g
D-Glucose 1.0 g
NaCl 130.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

387. *NATRANAEROBIUS* MEDIUM
KH_2PO_4 0.2 g
$MgCl_2 \times 6\ H_2O$ 0.1 g
KCL 0.2 g
NH_4Cl 0.5 g
NaCl 100 g
Yeast extract (Difco) 6.0 g
Tryptone (Difco) 6.0 g
Trace element solution SL-10 (see below) 1.0 ml
Vitamin solution (see below) 10 ml
Na_2CO_3 68.0 g
$NaHCO_3$ 38.0 g
L-Cysteine-HCl $\times\ H_2O$ 0.7 g
Glucose 5.0 g
Distilled water to 1000.0 ml
pH 10.5 (measured at 60^oC)
Dissolve ingredients (except carbonates, cysteine, vitamins and sucrose), then sparge medium with 100% N_2 gas for 30 – 45 min to make it anoxic. Add carbonate, bicarbonate and cysteine and adjust pH to 10.5. Dispense medium under 100% N_2 gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. After autoclaving add vitamins and glucose from sterile anoxic stock solutions prepared under 100% N_2 gas and sterilized by filtration.
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml

$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 0.1 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4.

388. *THERMODESULFOBIUM ACIDIPHILUM* MEDIUM
NH_4Cl 0.33 g
KCl 0.33 g
KH_2PO_4 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.33 g
Na_2SO_4 2.8 g
Trace mineral solution SL-10 (see below) 1.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Yeast extract 3.0 g
Vitamin solution (see below) 10.0 ml
$Na_2S \times 9\ H_2O$ 0.45 g
Distilled water 1000.0 ml
Dissolve ingredients except yeast extract, vitamins and sulfide. Adjust pH to 4.5 with H_2SO_4 and sparge medium with 100% CO_2 gas for 10 – 15 min to make it anoxic. Dispense medium under same gas atmosphere into anoxic Hungate-type tubes and autoclave. Add yeast extract, vitamins (sterilized by filtration) and sulfide from sterile anoxic stock solutions prepared under 100% N_2 gas. The sulfide stock solution (3% w/v) should be neutralized before use. The pH of the complete medium should be at 4.5.
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg
$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:

Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 0.1 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4

389. *TRICHOCOCCUS* MEDIUM

$CaCl_2 \times 2\ H_2O$ 0.12 g
$MgSO_4 \times 7\ H_2O$ 0.19 g
KH_2PO_4 0.45 g
K_2HPO_4 0.45 g
NaCl 0.9 g
$(NH_4)_2SO_4$ 0.9 g
Yeast extract 2.0 g
Trypticase peptone 2.0 g
Na-resazurin solution (0.1% w/v) 0.5 ml
L-Cysteine-HCl $\times H_2O$ 1.0 g
Na_2CO_3 2.5 g
D-Glucose 2.0 g
Distilled water 1000.0 ml
Dissolve ingredients (except cysteine, carbonate and glucose), adjust pH to 7.0 and sparge medium with 100% CO_2 gas for 10 – 15 min to make it anoxic. Add the cysteine and carbonate, then equilibrate the medium with the CO_2 gas to pH 7.0. Distribute medium under same gas atmosphere into anoxic Hungate-type tubes or serum vials and autoclave. Thereafter, add glucose from an anoxic stock solution prepared under 100% N_2 gas atmosphere and sterilized by filtration.

390. *SULFURIMONAS* MEDIUM
NH_4Cl 0.33 g
KCl 0.33 g
$CaCl_2 \times 2H_2O$ 0.03 g
KH_2PO_4 0.16 g
$MgCl_2 \times 6H_2O$ 0.33 g
NaCl 10.0 g
$NaHCO_3$ 2.0 g
Elemental sulfur 5.0 g
KNO_3 1.0 g
Trace element solution (see below) 1 ml
Vitamin solution (see below) 1 ml
pH of 7.5–8.0 (measured at 25 °C)
Distilled water 1000.0 ml
Trace element solution SL-10:
HCl (25%; 7.7 M) 10.0 ml
$FeCl_2 \times 4\ H_2O$ 1.5 g
$ZnCl_2$ 70.0 mg
$MnCl_2 \times 4\ H_2O$ 100.0 mg
H_3BO_3 6.0 mg

$CoCl_2 \times 6\ H_2O$ 190.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
$NiCl_2 \times 6\ H_2O$ 24.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 36.0 mg
Distilled water 990.0 ml
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine 0.1 mg
Riboflavin 5.0 mg
Pantotenoic acid 5.0 mg
p-Aminobenzoic acid 5.0 mg
Thiamine-HCl 5.0 mg
Nicotinic acid 5.0 mg
Vitamin B_{12} 0.1 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
pH 7.2-7.4.
The anoxic medium is prepared by boiling and cooling it under N_2 flow. No reducing agents are added. Elemental sulfur as electron donor is added to the Hungate tubes prior sterilization; potassium nitrate from anoxic sterile sock solution was added as electron acceptor
just before inoculation.

391. *ALKALIBACULUM* MEDIUM
NH_4Cl 0.33 g
KCl 0.33 g
$CaCl_2 \times 2\ H_2O$ 0.033 g
KH_2PO_4 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
NaOH 10.0 g
$NaHCO_3$ 2.0 g
Glucose 2.0 g
Yeast extract 50 mg
$Na_2S \times 9\ H_2O$ 0.5 g
Resazurin 0.2 mg
Trace element solution (see below) 1 ml
Vitamin solution (see below) 1 ml
pH of 8.0-8.5 (measured at 25 °C)
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (*Mohr's* salt) 784.0 mg
HCl (concentrated) 5.0 ml
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Distilled water 995.0 ml
Mohr's salt is dissolved firstly in concentrated HCl, then is mixed with distilled water and other salts are dissolved in the sequence indicated.
Vitamin solution:

Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 0.1 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg
Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
The medium is prepared anaerobically. $NaHCO_3$, NaOH and vitamins, $Na_2S \times 9\ H_2O$ are added after boiling and cooling of the medium under 100% N_2 in gas phase. Adjust the pH between 6.0 and 6.5 with sterile HCl or NaOH after autoclaving. Yeast extract must be added to the final solution before inoculation.

392. *CALORIBACTERIUM* MEDIUM
NH_4Cl 0.33 g
KCl 0.33 g
$CaCl_2 \times 6\ H_2O$ 0.033 g
KH_2PO_4 0.33 g
$MgCl_2 \times 6\ H_2O$ 0.33 g
NaOH 10.0 g
$NaHCO_3$ 2.0 g
Glucose 2.0 g
Yeast extract 50 mg
$Na_2S \times 9\ H_2O$ 0.5 g
Resazurin 0.2 mg
Trace element solution (see below) 1 ml
Vitamin solution (see below) 1 ml
pH of 7.5–8.0 (measured at 25°C)
Trace element solution:
$(NH_4)_2Fe(SO_4)_2 \times 6\ H_2O$ (*Mohr's* salt) 784.0 mg
HCl (concentrated) 5.0 ml
$CoCl_2 \times H_2O$ 238.0 mg
$(NH_4)_2Ni(SO_4)_2 \times 6\ H_2O$ 395.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 24.0 mg
$Na_2WO_4 \times 2\ H_2O$ 33.0 mg
$ZnSO_4 \times 7\ H_2O$ 144.0 mg
$CuCl_2 \times 2\ H_2O$ 2.0 mg
Na_2SeO_4 94.0 mg
H_3BO_3 6.0 mg
$MnCl_2 \times 4\ H_2O$ 99.0 mg
Distilled water 995.0 ml
Mohr's salt is dissolved firstly in concentrated HCl, then is mixed with distilled water and other salts are dissolved in the sequence indicated.
Vitamin solution:
Biotin 20.0 mg
Folic acid 20.0 mg
Pyridoxine 0.1 mg
Riboflavin 50.0 mg
Pantotenoic acid 50.0 mg
p-Aminobenzoic acid 50.0 mg
Thiamine-HCl 50.0 mg

Nicotinic acid 50.0 mg
Vitamin B_{12} 1.0 mg
Lipoic acid 50.0 mg
Distilled water 1000.0 ml
The medium is prepared anaerobically. $NaHCO_3$, NaOH and vitamins, $Na_2S \times 9H_2O$ are added after boiling and cooling of the medium under 100% CO_2 in gas phase. Adjust the pH between 6.0 and 6.5 with sterile HCl or NaOH after autoclaving. Yeast extract must be added to the final solution before inoculation.

393. PLATE COUNT AGAR WITH 0.5% NaCl
Tryptone 5.0 g
Yeast extract 2.5 g
Glucose 1.0 g
NaCl 5.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.0±0.2
Autoclave at 121°C for 15 min.

394. *LICHENIBACTERIUM MINOR* MEDIUM
Glucose 1.0 g
KH_2PO_4 0.2 g
NaCl 0.2 g
NH_4NO_3 0.2 g
$MgSO_4 \times 5\ H_2O$ 0.04 g
Yeast extract(without sodium chloride) 0.2 g
Vitamin solution (see below) 1 ml
Distilled water 1000.0 ml
pH 5.0-6.5
Vitamin solution:
p-Aminobenzoate 1.0 mg
Biotin 0.2 mg
Nicotinic acid 2.0 mg
Thiamine-HCl 1.0 mg
Ca-pantothenate 0.5 mg
Pyridoxamine 5.0 mg
Vitamin B_{12} 2.0 mg
Distilled water 1000.0 ml
Prepare the medium without the vitamin solution. Autoclave at 121°C for 15 min and add the vitamin solution from a filter-sterilized stock solution.

395. *FRIGORIGLOBUS TUNDRICOLA* MEDIUM
Glucose 0.5 g
Yeast extract 0.25 g
Peptone 0.25 g
N-acetylglucosamine 0.5 g
KH_2PO_4 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
NH_4NO_3 0.1 g
$CaCl_2 \times 6\ H_2O$ 0.02 g
Distilled water 1000.0 ml (800.0 ml for solid medium)
pH 5.8-6.0
Autoclave at 121°C for 15 min

For solid medium 8.0 g/l Phytagel in 200.0 ml distilled water (mix before autoclaving), autoclave separately. Gelrite gets solid below 80°C after autoclaving and in general polymerization starts fast after mixing with media.

396. *LACIPIRELLULA PARVULA* MEDIUM
Glucose 0.5 g
Yeast extract 0.25 g
Peptone 0.25 g
N-acetylglucosamine 0.5 g
KH_2PO_4 0.1 g
$MgSO_4 \times 7\ H_2O$ 0.1 g
NH_4NO_3 0.1 g
$CaCl_2 \times 6\ H_2O$ 0.02 g
Distilled water 1000.0 ml (800.0 ml for solid medium)
pH 6.8-7.5
Autoclave at 121°C for 15 min
For solid medium 8.0 g/l Phytagel in 200.0 ml distilled water (mix before autoclaving), autoclave separately. Gelrite gets solid below 80°C after autoclaving and in general polymerization starts fast after mixing with media.

397. *JANTHINOBACTEIUM LIVIDUM* MEDIUM
Peptone 30.0 g
Na_2HPO_4 2.0 g
NaCl 3.0 g
Agar 20.0 g
Distilled water 1000.0 ml
Autoclave at 121°C for 15 min

398. *RHODOPSEUDOMONAS PARAPALUSTRIS* MEDIUM
Tryptone 5.0 g
Yeast extract 2.5 g
Glucose 1.0 g
Distilled water 1000.0 ml
pH 6.8±0.2

399. *GEMMATA PALUSTRIS* MEDIUM
Hutner's basal salts medium (see below) 20.0 ml
Peptone 5.0 g
Yeast extract 0.25 g
Distilled water 965.0 ml (less for plates)
Adjust pH to 6.8-7.5 with 5 M KOH
After autoclaving and cooling (see below for plates) add to the medium
Vitamin solution 5.0 ml
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 0.0127 g
$FeSO_4 \times 7\ H_2O$ 0.099 g
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water. Sterilize by filtration, store at +4°C.
Metal solution "44":

Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Sterilize by filtration, store at +4°C.
Vitamin solution:
Biotin 4.0 mg
Folic acid 4.0 mg
Pyridoxine-HCl 20.0 mg
Riboflavin 10.0 mg
Thiamine-HCl $\times 2\ H_2O$ 10.0 mg
Nicotinamide 10.0 mg
D-Ca-pantothenate 10.0 mg
Vitamin B_{12} 0.2 mg
p-Aminobenzoic acid 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
For plates:
8.0 g/l Phytagel in 200.0 ml distilled water (mix before autoclaving), autoclave separately. Gelrite gets solid below 80°C after autoclaving and in general polymerization starts fast after mixing with media.

400. *THIOTHRIX* MEDIUM
NH_4Cl 0.3 g
$CaCl_2$ 0.03 g
KH_2PO_4 0.01 g
K_2HPO_4 0.022 g
$Na_2HPO_4 \times 7\ H_2O$ 0.035 g
$MgSO_4 \times 7\ H_2O$ 0.05 g
$FeCl_3 \times 6H_2O$ 0.002 g
$NaNO_3$ 0.30 g
Peptone 0.2 g
Na-acetate (10%) 2.5 ml
Na-lactate (10%) 2.5 ml
$NaHCO_3$ (10%) 5.0 ml
$Na_2S_2O_3 \times 5\ H_2O$ (10%) 10.0 ml
Vitamin solution (see below) 1.0 ml
Trace element solution according to *Hogland*: (see below) 1.0 ml
Distilled water 1000.0 ml
Vitamin solution:
Biotin 200.0 mg
Folic acid 20.0 mg
Pyridoxine-HCl 100.0 mg
Thiamine-HCl 50.0 mg
Riboflavin 100.0 mg
Nicotinic acid 50.0 mg
DL-Pantothenic acid 50.0 mg
Vitamin B_{12} 1.0 mg
p-Aminobenzoic acid 50.0 mg

Distilled water 1000.0 ml
Trace element solution according to Hogland:
EDTA 5.0 g
$FeSO_4 \times 7\ H_2O$ 2.0 g
$ZnSO_4 \times 7\ H_2O$ 100.0 mg
$MnCl_2 \times 4\ H_2O$ 30.0 mg
H_3BO_3 300.0 mg
$CoCl_2 \times 6\ H_2O$ 200.0 mg
$CuCl_2$ 10.0 mg
$NiCl_2 \times 6\ H_2O$ 20.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 20.0 mg
Distilled water 1000.0 ml
pH 7.5 (adjust with 1% HCl)
To prepare the trace element solution, preliminarily acidify water to pH 3.0-4.0 with HCl. Sterilize thiosulfate, acetate, lactate, bicarbonate, trace elements and vitamins separately and add to the main medium prior to inoculation. Sterilize the vitamin solution by filtration, others solutions and base medium by autoclaving at 121°C for 15 min.

401. *LICHENICOCCUS ROSEUS* MEDIUM (LRM)

Glucose 1.0 g
KH_2PO_4 0.2 g
NaCl 0.2 g
NH_4NO_3 0.2 g
$MgSO_4 \times 5\ H_2O$ 0.04 g
Yeast extract(without sodium chloride) 0.2 g
Vitamin solution (see below) 1 ml
Distilled water 1000.0 ml
pH 4.5
Vitamin solution:
p-Aminobenzoic acid 1.0 mg
Biotin 0.2 mg
Nicotinic acid 2.0 mg
Thiamine-HCl 1.0 mg
D-Ca-pantothenate 0.5 mg
Pyridoxamine 5.0 mg
Vitamin B_{12} 2.0 mg
Distilled water 100.0 ml
Prepare the medium without the vitamin solution. Autoclave at 121°C for 15 min and add the vitamin solution from a filter-sterilized stock solution.

402. *PROSTHECODIMORPA STALEYI* MEDIUM (PSM)

Glucose 0.3 g
Na_2HPO_4 0.071 g
$(NH_4)_2SO_4$ 0.25 g
Yeast extract 0.05 g
Peptone 0.1 g
Vitamin solution (see below) 10.0 мл
Hutner's salt solution (see below) 20.0 мл
Distilled water 970.0 мл
Vitamin solution :
Biotin 2.0 мг
Folic acid 2.0 мг
Thiamine-HCl 5.0 мг
D-Ca- Panthothenate 5.0 мг

Vitamin B_{12} 0.1 мг
Riboflavin 5.0 мг
Distilled water 1000.0 мл
Hutner's Salt Solution:
Nitrilotriacetic acid 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.335 g
$FeSO_4 \times 7\ H_2O$ 99.0 mg
$(NH_4)_6Mo_7O_{24} \times 4\ H_2O$ 9.25 mg
"Metals 44" 50.0 ml
Distilled water 1000.0 мл
"Metals 44":
$ZnSO_4 \times 7\ H_2O$ 1.095 g
$FeSO_4 \times 7\ H_2O$ 0.5 g
EDTA-Na 0.25 g
$MnSO_4 \times H_2O$ 0.154 g
$CuSO_4 \times 5\ H_2O$ 39.2 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 100.0 мл

403. *ALKALISPIRILLUM MOBILE* MEDIUM (AMM)
NaCl 20.0 g
$Na_2S_2O_3$ 1.0 g
KH_2PO_4 0.8 g
Na-acetate 2.0 g
Yeast extract 1.0 g
Trace elements (see below) 1.0 ml
$MgCl_2 \times 7\ H_2O$ 0.1 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
NH_4Cl 0.8 g
Na_2CO_3 21.2 g
$NaHCO_3$ (8 %) 168.0 ml
Distilled water 832.0 ml
Trace element solution (A):
$FeCl_2 \times 4\ H_2O$ 1.8 g
$CoCl_2 \times 6\ H_2O$ 250.0 mg
$NiCl_2 \times 6\ H_2O$ 10.0 mg
$CuCl_2 \times 2\ H_2O$ 10.0 mg
$MnCl_2 \times 4\ H_2O$ 70.0 mg
$ZnCl_2$ 100.0 mg
H_3BO_3 500.0 mg
$Na_2MoO_4 \times 2\ H_2O$ 30.0 mg
$Na_2SeO_3 \times 5\ H_2O$ 10.0 mg
Distilled water 1000.0 ml
For dissolving adjust pH to about 3 with 1 N HCl.

We recommend that liquid and solid media be made by autoclaving the Na_2CO_3 separately, otherwise the high pH will cause ammonia to be lost. When making media solidified with agar (20 g/l) the agar should also not be autoclaved with the Na_2CO_3 otherwise the agar will be hydrolysed. When mixing the ingredients for media cool all components to about 55 °C otherwise hydrolysis of the agar may occur. Adjust pH after autoclaving by adding the $NaHCO_3$ (8 %) to pH 9.0. Please note that the $NaHCO_3$ solution should be filter sterilized

404. PEPTONE MEAT AGAR WITH MANGANESE (PMA-Mn)
Peptone 10.0 g
NaCl 5.0 g
Beef extract 3.0 g
$MnSO_4 \times H_2O$ 100 mg
Agar 20.0 g
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min.

405. *MAGNETOSPIRILLUM KUZNETSOVII* MEDIUM (MKM)
KH_2PO_4 0.68 g
$NaNO_3$ 0.12 g
L(+)-Tartaric acid 0.37 g
Succinic acid 0.37 g
Na-acetate $\times$ 3 H_2O 0.05 g
Vitamin solution (see below) 10.0 ml
Trace element solution (see below) 5.0 ml
Fe(III) quinate solution (see below) 2.0 ml
Na-resazurin solution (0.1% w/v) 0.5 ml
Na-thioglycolate 0.05 g
Distilled water 1000.0 ml
Trace element solution:
Nitrilotriacetic acid 1.5 g
$MgSO_4 \times 7\ H_2O$ 3.0 g
$MnSO_4 \times H_2O$ 0.5 g
NaCl 1.0 g
$FeSO_4 \times 7\ H_2O$ 0.1 g
$CoSO_4 \times 7\ H_2O$ 0.18 g
$CaCl_2 \times 2\ H_2O$ 0.1 g
$ZnSO_4 \times 7\ H_2O$ 0.18 g
$CuSO_4 \times 5\ H_2O$ 0.01 g
$KAl(SO_4)_2 \times 12\ H_2O$ 0.02 g
H_3BO_3 0.01 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01 g
$NiCl_2 \times 6\ H_2O$ 0.03 g
$Na_2SeO_3 \times 5\ H_2O$ 0.3 mg
$Na_2WO_4 \times 2\ H_2O$ 0.4 mg
Distilled water 1000.0 ml
First dissolve nitrilotriacetic acid and adjust pH to 6.5 with KOH, then add minerals. Adjust final to pH 7.0 with KOH.
Vitamin solution:
Biotin 2.0 mg
Folic acid 2.0 mg
Pyridoxine-HCl 10.0 mg
Thiamine-HCl $\times$ 2 H_2O 5.0 mg
Riboflavin 5.0 mg
Nicotinic acid 5.0 mg
D-Ca-pantothenate 5.0 mg
Vitamin B_{12} 0.1 mg
p-Aminobenzoic acid 5.0 mg
Lipoic acid 5.0 mg
Distilled water 1000.0 ml
Ferric Quinate Solution, 0.01 M:

$FeCl_3 \times 6\ H_2O$ 4.5 g
Quinic acid 1.9 g
Distilled water 1000.0 ml
Sterilize by filtration under 100% N_2 gas atmosphere.
Dissolve ingredients (except thioglycolate) and adjust pH to 6.75 with NaOH. Sparge medium with 100% N_2 gas for 30-45 min and dispense under the same gas atmosphere into anoxic Hungate – type tubes to 50% of their volume. Before inoculation add thioglycolate from a 0.5% (w/v) stock solution, freshly prepared under 100% N_2 gas and filter-sterilized. Then add sterile air to a concentration of 1.0 % O_2 in the vial.

406. COLUMBIA AGAR WITH BLOOD (CA-B)
Special mixture of peptones 23.0 g
Defibrinated blood 50.0 g
Starch 1.0 g
NaCl 5.0 г
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.3±0.2.
Adjust pH to 7.3±0.2. Autoclave at 121°C for 15 min.

407. *PSEUDOALTEROMONAS TELLURITIREDUCENS* MEDIUM (PTM)
$MgSO_4 \times 7\ H_2O$ 0.5 g
KH_2PO_4 0.3 g
NH_4Cl 0.3 g
$CaCl_2 \times 2\ H_2O$ 0.05 g
Na-acetate $\times 3\ H_2O$ 10.0 g
Yeast extract 0.5 g
Casamino acids 0.5 g
NaCl 15.0 g
Trace elements solution (see below) 2.0 ml
Vitamin solution (see below) 2.0 ml
Distilled water 1000.0 ml
Trace elements solution:
$MnCl_2 \times 4\ H_2O$ 0.3 g
$FeSO_4 \times 7\ H_2O$ 0.03 g
Distilled water 1000.0 ml
Vitamin solution:
Biotin 80 mg
Thiamine-HCl 400.0 mg
Nicotinic acid 400.0 mg
Vitamin B_{12} 20.0 μg
Distilled water 1000.0 ml
After autoclaving at 121°C for 15 min adjust to pH 7.8 with $NaHCO_3$. Add the vitamin solution and trace elements solution from sterile stock solutions.

408. *PLANCTOMYCETES* SP. MEDIUM (PspM
Hutner's basal salts medium (see below) 20.0 ml
Peptone Bacto 1.0 g
Yeast extract Bacto 1.0 g
HEPES 2.38 g
Artificial seawater (see below) 250.0 ml
Distilled water 690.0 ml (less for plates)
Adjust pH to 7.5 with 5 M KOH
After autoclaving and cooling (please see below for plates) add to the medium:

Vitamin solution 5.0 ml
N-Acetylglucosamine 20.0 ml of 50.0 g/l stock solution
Trace element solution 1.0 ml
Artificial sea water:
NaCl 46.94 g
Na_2SO_4 7.84 g
$MgCl_2 \times 6\ H_2O$ 21.28 g
$CaCl_2 \times 2\ H_2O$ 2.86 g
$NaHCO_3$ 0.384 g
KCl 1.384 g
KBr 0.192 g
H_3BO_3 0.052 g
$SrCl_2 \times 6\ H_2O$ 0.08 g
NaF 0.0 6 g
Distilled water 1000.0 ml
Do not autoclave. Due to high salt concentration, no filtration. Sometimes precipitation after a while or fungal growth observed, thus better prepare fresh. Store at room temperature.
Hutner's basal salts medium:
Nitrilotriacetic acid (NTA) 10.0 g
$MgSO_4 \times 7\ H_2O$ 29.7 g
$CaCl_2 \times 2\ H_2O$ 3.34 g
$Na_2MoO_4 \times 2\ H_2O$ 0.01267 g
$FeSO_4 \times 7\ H_2O$ 0.099 g
Metal salt solution "44" (see below) 50.0 ml
Dissolve NTA first by neutralizing with KOH, then add other salts.
pH 7.2 (adjust with KOH or H_2SO_4).
Adjust volume to 1000.0 ml with distilled water. Sterilize by filtration, store at +4°C.
Metal solution "44":
Na-EDTA 250.0 mg
$ZnSO_4 \times 7\ H_2O$ 1095.0 mg
$FeSO_4 \times 7\ H_2O$ 500.0 mg
$MnSO_4 \times 7\ H_2O$ 154.0 mg
$CuSO_4 \times 5\ H_2O$ 39.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 24.8 mg
$Na_2B_4O_7 \times 10\ H_2O$ 17.7 mg
Distilled water 1000.0 ml
Dissolve Na-EDTA and add a few drops of concentrated H_2SO_4 to retard precipitation of heavy metal ions.
Sterilize by filtration, store at +4°C.
Vitamin solution:
Biotin 4.0 mg
Folic acid 4.0 mg
Pyridoxine-HCl 20.0 mg
Riboflavine 10.0 mg
Thiamine-HCl × 2 H2O 10.0 mg
Nicotinamide 10.0 mg
D-Ca-pantothenate 10.0 mg
Vitamin B_{12} 0.2 mg
p-Aminobenzoic acid 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
Trace element solution:
Na-Nitrilotriacetat 1.5 g
$MnSO_4 \times H_2O$ 500.0 mg

$FeSO_4 \times 7\ H_2O$ 100.0 mg
$Co(NO_3)_2 \times 6\ H_2O$ 100.0 mg
$ZnCl_2$ 100.0 mg
$NiCl_2 \times 6\ H_2O$ 50.0 mg
H_2SeO_3 50 mg
$CuSO_4 \times 5\ H_2O$ 10.0 mg
$AlK(SO_4)_2 \times 12\ H_2O$ 10.0 mg
H_3BO_3 10.0 mg
$NaMoO_4 \times 2\ H_2O$ 10.0 mg
$Na_2WO_4 \times 2\ H_2O$ 10.0 mg
Distilled water 1000.0 ml
Sterilize by filtration, store in the dark and cold (+4°C)
For plates:
15.0 g/l Agar (Bacto) 3x washed with distilled water, autoclave separately and take volume of distilled water into account.
or
8.0 g/l Phytagel in 200.0 ml distilled water (mix before autoclaving), autoclave separately. Gelrite gets solid below 80°C after autoclaving and in general polymerization starts fast after mixing with media.

409. SEA WATER MEDIUM FOR *HALOMONAS* (SWM-H)
Sea salt 37.9 g
Yeast extract 3.0 g
Peptone 10.0 g
NaCl 60 g
Agar 20.0 g
Distilled water to 1000.0 ml
pH 7.2-7.4
Autoclave at 121°C for 15 min.

410. *SHINELLA* SP. MEDIUM (SspM)
Tryptone 5.0 g
Yeast extract 2.5 g
Glucose 1.0 g
NaCl 5.0 g
Agar 15.0 g
Distilled water 1000.0 ml
pH 7.0±0.2
Autoclave at 121°C for 15 min.

411. MEDIUM FOR *METHYLOLIGELLA HALOTOLERANS* (MMH)
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g
NaCl 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.02 g
Methanol 20.0 ml
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min. Methanol is filter sterilized.

412. MEDIUM FOR *PARACOCCUS SIMPLEX* (MPS)
KH_2PO_4 2.0 g
$(NH_4)_2SO_4$ 2.0 g
$MgSO_4 \times 7\ H_2O$ 0.025 g

NaCl 0.5 g
$FeSO_4 \times 7\ H_2O$ 0.02 g
Methylamine solution 30.0 ml
Distilled water 1000.0 ml
pH 7.0
Autoclave at 121°C for 15 min. 10 % solution of methylamine autoclave at 111°C for 30 min.