

Medium 199 (M199) Formulation

| Cat. No. | 10-060 1x, Liquid | 50-050 Powder | 50-051 Powder | 90-050 Powder |
|---|----------------------|------------------|------------------|------------------|
| | mg/L | mg/L | mg/L | mg/L |
| Inorganic Salts | | | | |
| CaCl ₂ (anhydrous) | 200.00 | 200.00 | 140.00 | 200.00 |
| Fe(NO ₃) ₃ • 9H ₂ O | 0.72 | 0.72 | 0.72 | 0.72 |
| KCl | 400.00 | 400.00 | 400.00 | 400.00 |
| KH ₂ PO ₄ | -- | -- | 60.00 | -- |
| MgSO ₄ (anhydrous) | 97.70 | 97.70 | 97.70 | 97.70 |
| NaCl | 6800.00 | 6800.00 | 8000.00 | 6800.00 |
| NaH ₂ PO ₄ • H ₂ O | 140.00 | 140.00 | -- | 140.00 |
| Na ₂ HPO ₄ (anhydrous) | -- | -- | 47.50 | -- |
| NaHCO ₃ | 2200.00 | -- | -- | -- |
| Amino Acids | | | | |
| L-Alanine | 25.00 | 25.00 | 25.00 | 25.00 |
| L-Arginine • HCl | 70.00 | 70.00 | 70.00 | 70.00 |
| L-Aspartic acid | 30.00 | 30.00 | 30.00 | 30.00 |
| L-Cysteine • HCl • H ₂ O | 0.11 | 0.11 | 0.11 | 0.11 |
| L-Cystine • 2HCl | 26.00 | 26.00 | 26.00 | 26.00 |
| L-Glutamic acid | 75.00 | 75.00 | 75.00 | 75.00 |
| L-Glutamine | 100.00 | 100.00 | 100.00 | -- |
| Glycine | 50.00 | 50.00 | 50.00 | 50.00 |
| L-Histidine • HCl • H ₂ O | 21.88 | 21.88 | 21.88 | 21.88 |
| Hydroxy-L-proline | 10.00 | 10.00 | 10.00 | 10.00 |
| L-Isoleucine | 20.00 | 20.00 | 20.00 | 20.00 |
| L-Leucine | 60.00 | 60.00 | 60.00 | 60.00 |
| L-Lysine • HCl | 70.00 | 70.00 | 70.00 | 70.00 |
| L-Methionine | 15.00 | 15.00 | 15.00 | 15.00 |
| L-Phenylalanine | 25.00 | 25.00 | 25.00 | 25.00 |
| L-Proline | 40.00 | 40.00 | 40.00 | 40.00 |
| L-Serine | 25.00 | 25.00 | 25.00 | 25.00 |
| L-Threonine | 30.00 | 30.00 | 30.00 | 30.00 |
| L-Tryptophan | 10.00 | 10.00 | 10.00 | 10.00 |
| L-Tyrosine • 2Na • 2H ₂ O | 57.87 | 57.87 | 57.87 | 57.87 |
| L-Valine | 25.00 | 25.00 | 25.00 | 25.00 |
| Vitamins | | | | |
| DL-alpha-Tocopherol • PO ₄ • Na | 0.01 | 0.01 | 0.01 | 0.01 |
| Ascorbic acid | 0.05 | 0.05 | 0.05 | 0.05 |
| Biotin | 0.01 | 0.01 | 0.01 | 0.01 |
| Calciferol | 0.10 | 0.10 | 0.10 | 0.10 |
| D-Calcium pantothenate | 0.01 | 0.01 | 0.01 | 0.01 |
| Choline chloride | 0.50 | 0.50 | 0.50 | 0.50 |
| Folic acid | 0.01 | 0.01 | 0.01 | 0.01 |

| Cat. No. | 10-060 1x, Liquid | 50-050 Powder | 50-051 Powder | 90-050 Powder |
|---|----------------------|------------------|------------------|------------------|
| | mg/L | mg/L | mg/L | mg/L |
| Vitamins | | | | |
| i-Inositol | 0.05 | 0.05 | 0.05 | 0.05 |
| Menadione • NaHSO ₃ • 3H ₂ O | 0.019 | 0.019 | 0.019 | 0.019 |
| Nicotinic acid | 0.025 | 0.025 | 0.025 | 0.025 |
| Nicotinamide | 0.025 | 0.025 | 0.025 | 0.025 |
| Para-Aminobenzoic acid | 0.05 | 0.05 | 0.05 | 0.05 |
| Pyridoxine • HCl | 0.05 | 0.05 | 0.05 | 0.05 |
| Riboflavin | 0.01 | 0.01 | 0.01 | 0.01 |
| Thiamine • HCl | 0.01 | 0.01 | 0.01 | 0.01 |
| Vitamin A acetate | 0.14 | 0.14 | 0.14 | 0.14 |
| Other | | | | |
| Adenine sulfate | 10.00 | 10.00 | 10.00 | 10.00 |
| 5-Adenylic acid • H ₂ O | 0.20 | 0.20 | 0.20 | 0.20 |
| ATP, 2Na • 3H ₂ O | 1.00 | 1.00 | 1.00 | 1.00 |
| Cholesterol | 0.20 | 0.20 | 0.20 | 0.20 |
| 2-Deoxy-D-ribose | 0.50 | 0.50 | 0.50 | 0.50 |
| D-Glucose | 1000.00 | 1000.00 | 1000.00 | 1000.00 |
| Glutathione (reduced) | 0.05 | 0.05 | 0.05 | 0.05 |
| Guanine • HCl | 0.30 | 0.30 | 0.30 | 0.30 |
| Hypoxanthine, Na | 0.354 | 0.354 | 0.354 | 0.354 |
| Phenol red, Na | 10.00 | 10.00 | 10.00 | -- |
| D-Ribose | 0.50 | 0.50 | 0.50 | 0.50 |
| Sodium Acetate | 50.00 | 50.00 | 50.00 | 50.00 |
| Thymine | 0.30 | 0.30 | 0.30 | 0.30 |
| Polysorbate 80 | 20.00 | 20.00 | 20.00 | 20.00 |
| Uracil | 0.30 | 0.30 | 0.30 | 0.30 |
| xanthine, Na | 0.34 | 0.34 | 0.34 | 0.34 |
| Add | | | | |
| NaHCO ₃ Powder (g/L) | -- | 2.20 | 0.34 | 2.12 |
| 7.5% Solution (mL/L) | -- | 29.33 | 4.70 | 29.33 |
| L-Glutamine Powder (mg/L) | -- | -- | -- | 100.00 |
| 200 mM Solution (mL/L) | -- | -- | -- | 3.40 |
| Specifications | | | | |
| pH (before buffer) | -- | 4.5 ± 0.5 | 5.25 ± 0.6 | 4.5 ± 0.5 |
| pH (after buffer) | 7.2 ± 0.2 | 7.5 ± 0.5 | 6.9 ± 0.2 | 7.5 ± 0.5 |
| Osmolality (mOsm/kg) Before adjustment After adjustment | 290 ± 30 | INFO 290 ± 30 | 295 ± 20 INFO | INFO 290 ± 30 |
| Grams of powder required to prepare 1L (1x Solution) | -- | 9.50 | 10.63 | 9.39 |

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