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## TECHNICAL INFORMATION

Catalog Number: 1023120, 1023122, 1023124

### Medium 199 with Hanks' Salts (H199), powder, with L-glutamine without sodium bicarbonate

**Description:** Medium 199, originally described by Morgan and his colleagues (1950), is a completely defined nutritional source for cell culture. Their investigations demonstrated that cell growth could be measured in this medium. It has broad species applicability including the culturing of non-transformed cell types. It may be used for vaccine production and the in vitro cultivation of rat lens tissues and primary mouse pancreatic epithelial explants. It is available in either Earle's or Hanks' salts.

**Note:** The DL-amino acids of the original formulation have been replaced by L-amino acids at half the concentration.

#### Formulation:

<b>Components</b>		<b>Mol. Wt.</b>	<b>Mol. (mM)</b>
<b>Amino Acids</b>	<b>mg/L</b>		
L-Alanine		89.1	0.28
L-Arginine HCl	25.000	174.2	0.40
L-Aspartic Acid	70.000	133.1	0.23
L-Cysteine HCl H <sub>2</sub> O	30.000	175.6	0.0006
L-Cystine 2HCl	0.110	313.2	0.08
L-Glutamic Acid	26.000	147.1	0.51
L-Glutamine	75.000	146.1	0.68
Glycine	100.000	75.07	0.67
L-Histidine HCl H <sub>2</sub> O	50.000	209.6	0.10
L-Hydroxyproline	21.880	131.1	0.08
L-Isoleucine	10.000	131.2	0.15
	20.000		

L-Leucine		131.2	0.46
L-Lysine HCl	60.000	182.6	0.38
L-Methionine	70.000	149.2	0.10
L-Phenylalanine	15.000	165.2	0.15
L-Proline	25.000	115.1	0.35
L-Serine	40.000	105.1	0.24
L-Threonine	25.000	119.1	0.25
L-Tryptophan	30.000	204.2	0.05
L-Tyrosine 2Na 2H <sub>2</sub> O	10.000	261.2	0.22
L-Valine	57.870	117.1	0.21
<b>Vitamins</b>	25.000		
Biotin		244.3	0.00004
Calciferol	0.010	396.7	0.0003
Choline Chloride	0.100	139.6	0.0036
D-Calcium Pantothenate	0.500	238.3	0.00004
DL- $\alpha$ -Tocopherol PO <sub>4</sub> Na <sub>2</sub>	0.010	554.7	0.00002
Folic Acid	0.010	441.4	0.00002
L-Ascorbic Acid	0.010	176.1	0.0003
Menadione Sodium Bisulfite 3H <sub>2</sub> O	0.050	330.2	0.0001
myo-Inositol	0.019	180.2	0.0003
Niacin	0.050	123.1	0.0002
Nicotinamide	0.025	122.13	0.0002
para-Aminobenzoic Acid	0.025		

0.050

137.1

0.0004

Pyridoxine HCl		205.6	0.0002
Riboflavin	0.050	376.4	0.00003
Thiamine HCl	0.010	337.3	0.0001
Vitamin A Acetate	0.050	328.5	0.0004
<b>Inorganic Salts</b>	0.140		
Calcium Chloride [CaCl <sub>2</sub> ]		111	1.26
Ferric Nitrate [Fe(NO <sub>3</sub> ) <sub>3</sub> 9H <sub>2</sub> O] Nonahydrate	140.000	404	0.0018
Magnesium Sulfate [MgSO <sub>4</sub> ]	0.720	120.4	0.81
Potassium Chloride [KCl]	97.700	74.55	5.37
Potassium Phosphate Monobasic [KH <sub>2</sub> PO <sub>4</sub> ]	400.000	136.09	0.44
Sodium Chloride [NaCl]	60.000	58.44	136.89
Sodium Phosphate Dibasic [Na <sub>2</sub> HPO <sub>4</sub> ]	8000.000	141.96	0.33
<b>Other</b>	47.500		
2-Deoxy-D-Ribose		134.1	0.0037
5-Adenylic Acid H <sub>2</sub> O	0.500	347.2	0.0006
Adenine Sulfate	0.200	386.4	0.0259
ATP 2Na 3H <sub>2</sub> O	10.000	605.2	0.0017
Cholesterol	1.000	386.7	0.0005
Dextrose	0.200	180.2	5.5494
D-Ribose	1000.000	150.1	0.0033
Glutathione (reduced)	0.500	307.33	0.0002
Guanine HCl	0.050	187.55	0.0016
Hypoxanthine Na	0.300	159.08	0.0022
	0.354		

Phenol Red Sodium Salt		376.4	0.0266
Sodium Acetate	10.000	82.03	0.6095
Thymine	50.000	126.1	0.0024
Tween 80	0.300	n/a	n/a
Uracil	20.000	112.1	0.0027
Xanthine Na	0.300	174.1	0.0020
<b>Add</b>	0.340		
NaHCO <sub>3</sub> Powder (g/L)		0.350	
NaHCO <sub>3</sub> 7.5% Solution (mL/L)		4.670	

**Availability:**

**1X Liquid:**

**Medium 199 with Earle's Salts:**

Catalog Number	Description	Size
1220354	1X E199 with L-glutamine	500 ml
1220249	1X E199 without L-glutamine	100 ml
1220254		500 ml
1220449	1X E199 with 20 mM HEPES, without sodium bicarbonate, L-glutamine	100 ml

**Medium 199 with Hanks' Salts:**

Catalog Number	Description	Size
1223354	1X H199 with L-glutamine	500 ml
1223249	1X H199 without L-glutamine	100 ml
1223254		500 ml

**10X Liquid:**

**Medium 199 with Earle's Salts:**

Catalog Number	Description	Size
1420049	10X E199 without sodium bicarbonate, L-glutamine	100 ml
1420054		500 ml

**Medium 199 with Hanks' Salts:**

Catalog Number	Description	Size
1423054	10X H199 without sodium bicarbonate, L-glutamine	500 ml

**Powders:**

**Medium 199 with Earle's Salts:**

Catalog Number	Description	Size
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1020120	E199 with L-glutamine, without sodium bicarbonate	10 x 1 liter
1020122		1 x 10 liter

Medium 199 with Hanks' Salts:

Catalog Number	Description	Size
1023120	H199 with L-glutamine, without sodium bicarbonate	10 x 1 liter
1023122		1 x 10 liter
1023124		1 x 50 liter

**References:**

- Morgan, J.F., et. al., *Proc. Soc. Exptl. Biol. Med.*, v. **51**, 1 (1950).
- Morgan, J.F., et. al., *J. Natl. Cancer Inst.*, v. **16**, 557 (1955).
- Parker, R.C., *In: Methods of Tissue Culture*, **3rd Ed.**, Harper & Row, New York (1961).