

# Product Information

## Minimum Essential Medium Joklik's Modified

with Earle's Balanced Salts, with 2.0 mM L-glutamine, without calcium chloride, without sodium bicarbonate

CATALOG NO. 56449C

### Description

Minimum Essential Medium (MEM) with Earle's Balanced Salts was developed by Harry Eagle as a result of his studies to determine the essential nutritional requirements of mouse L cells and HeLa cells in culture. He demonstrated that these cells require 13 amino acids and seven vitamins to grow and reproduce *in vitro*. MEM is a modification of Eagle's earlier medium Basal Medium Eagle (BME), containing higher concentrations of the essential nutrients. This medium has demonstrated the ability to support a variety of normal and transformed cells in culture and contains Earle's Balanced Salts, which makes it suitable for use in atmospheres charged with CO<sub>2</sub> gas.

Minimum Essential Medium Joklik's Modification (JMEM) was designed for suspension culture systems. Calcium chloride has been omitted to reduce cellular attachment.

### Precautions

Use aseptic technique when handling or supplementing this medium after filtration. This product is for further manufacturing use. THIS PRODUCT IS NOT INTENDED FOR HUMAN OR THERAPEUTIC USE.

### Storage

Store dry powder medium at 2 to 8 C. Do not use after the expiration date. Store hydrated medium protected from light at 2 to 8 C.

### Indications of Deterioration

Dry powder medium should be free flowing. Do not use if powder is caked. Prepared medium should be clear of particulates and flocculent material. Do not use if liquid medium is cloudy or contains precipitate. Other evidence of deterioration may include color change or degradation of physical or performance characteristics.

### Formulation

Component (all components measured in mg/L)	
<b>INORGANIC SALTS</b>	
Magnesium chloride anhydrous	93.680
Potassium chloride	400.000
Sodium chloride	6500.000
Sodium phosphate monobasic anhydrous	1153.800
<b>VITAMINS</b>	
D-calcium pantothenate	1.000
Choline chloride	1.000
Folic acid	1.000
i-inositol	2.000
Niacinamide	1.000
Pyridoxal HCl	1.000
Riboflavin	0.100
Thiamine HCl	1.000
<b>AMINO ACIDS</b>	
L-arginine HCl	126.000
L-cystine 2HCl	32.400
L-glutamine	292.000
L-histidine free base	31.000
L-isoleucine	52.000
L-leucine	52.000
L-lysine free base	58.000
L-methionine	15.000
L-phenylalanine	32.000
L-threonine	48.000
L-tryptophan	10.000
L-tyrosine 2Na dihydrate	54.520
L-valine	46.000
<b>OTHER</b>	
Dextrose anhydrous	2000.000
Phenol red sodium salt	10.620
ADD: Sodium bicarbonate	2000.000
Grams of powder per liter	11.015

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## Preparation Instructions

1. Measure 80 - 90% of the final volume of cell culture grade water (Catalog No. 59900C) into an appropriate size mixing vessel. Water temperature should be 15 to 30 C. Do not heat water.
2. Add the dry powder medium to the water. Rinse the original package with a small amount of cell culture grade water to remove all traces of powder and add to the solution. Mix until completely dissolved.
3. For each liter being prepared, add 2.0 g/L of sodium bicarbonate (Catalog No. 90421C) or 26.7 mL/L of sodium bicarbonate solution 7.5% (Catalog No. 59221C). Mix until completely dissolved.
4. While stirring the solution in Step 3, adjust the pH to 6.9 - 7.1 using NaOH 1N (Catalog No. 59223C) or HCl 1N. The pH of bicarbonate buffered solutions usually rises 0.1 - 0.2 units during filtration.
5. Add cell culture grade water to the solution in Step 4 to bring it to the final volume. Keep the vessel closed until the solution is filtered to avoid fluctuations in pH.
6. Sterilize the solution using a membrane filter with a pore size of 0.22 µm or less. A peristaltic pump or an inert gas such as nitrogen can be used to provide positive pressure at 3 - 15 psi. Do not use CO<sub>2</sub> gas.
7. Sterile solutions should be dispensed aseptically into sterile containers. Store protected from light at 2 to 8 C.
8. Supplements, such as antibiotics, can be added to the sterilized solution using aseptic technique. Storage conditions and shelf life of the supplemented product may be affected by the nature of the supplements. Sterile serum should not be refiltered before or after being added to sterile medium because growth promoting capacity may be reduced upon refiltration.

**NOTE:** Dry powder medium is extremely hygroscopic and must be protected from atmospheric moisture. We recommend that the entire contents of each package be used immediately after opening.

## Characteristics

### Appearance

Off-white free-flowing powder

### Bioburden

≤ 100 CFU/100 mL

### Endotoxin

≤ 1.0 EU/mL

### Osmolality (as supplied)

230 - 270 mOsm/kg H<sub>2</sub>O

### Osmolality (with NaHCO<sub>3</sub>)

270 - 310 mOsm/kg H<sub>2</sub>O

### pH (as supplied)

5.4 - 5.8

### pH (with NaHCO<sub>3</sub>)

6.7 - 7.1

## References

1. Eagle, H., *Science* (1959) 130:432.
2. Eagle, H., Peil, K. A., Fleischman, R., *JBC* (1957) 228:847.
3. Hanks, J. H., Wallace, R. E., *PSEBM* (1949) 71:196.
4. Lockhart, R. Z., Eagle, H., *Science* (1959) 192:252.

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