

**Product :**
MINERAL MODIFIED GLUTAMATE MEDIUM BASE**Specification**

Liquid medium for the selective enrichment of *E. coli* according to ISO Standard 16649-3.

Formula * in g/L

Lactose.....	20,000	Calcium chloride.....	0,020
Dipotassium phosphate.....	1,800	Bromocresol purple.....	0,020
Sodium formate.....	0,500	Thiamine.....	0,002
Magnesium sulfate.....	0,200	Nicotinic acid.....	0,002
L-Cysteine.....	0,040	Pantothenic acid.....	0,002
L(+)-Arginine.....	0,040		
L(-)-Aspartic acid.....	0,048	Final pH 6,7 ±0,1 at 25 °C	
Ammonium iron (III) citrate.....	0,020		

* Adjusted and /or supplemented as required to meet performance criteria

Directions

Single strength: Dissolve 11,35 g of powder in 1 L of distilled water. To this add 2,5 g of ammonium chloride (Art. No. AM0273) and 6,35 g of monosodium glutamate (Art. No. SO0400). Mix until totally dissolved, and heat only if necessary. Distribute 10 mL volumes into 16x160 mm tubes fitted with Durham tube. Sterilize in the autoclave at 116°C for 10 minutes or alternatively, heat to 100°C by flowing steam immersion for 30 minutes on three successive days.

Double strength: Dissolve 22,7 g of powder in 1 L of distilled water. To this add 5 g of ammonium chloride (Art. No. AM0273) and 12,7 g of monosodium glutamate (Art. No. SO0400). Mix until totally dissolved, and heat only if necessary. Distribute 10 mL volumes into 20x200 mm tubes fitted with Durham tube. Sterilize in the autoclave at 116°C for 10 minutes or alternatively, heat to 100°C by flowing steam immersion for 30 minutes on three successive days.

Note: The pH value is critical for medium performance. The sterilization process can affect the pH and care must taken to adjust the medium to give a final pH of 6,7.

Description

Glutamate-Lactose-Formate Broth was proposed in 1959 by Gray as alternative medium for the presumptive determination of coliforms in water. With several modifications, the medium has evolved to the current Minerals Modified Glutamate Medium (MMGM) and now is considered a valid alternative for the detection of coliforms and *Escherichia coli* in different types of samples.

In Great Britain this is the elective medium for the verification of faecal contamination in the chlorinated drinking water supplies. Several studies on the coliforms present in foods have shown the superiority of MMGM over other enrichment media as MacConkey Broth (Art. No. 02-611), Brilliant Green Bile Broth (Art. No. 02-041) or Lauryl sulfate Broth (Art. No. 02-108).

The 16649-3:2005 ISO Standard recommends the MMGM for the selective enrichment of *E. coli* and for the Most Probable Number enumeration.

Technique

The sample is prepared or diluted according to the established protocol and a series of 3, 5 or 10 tubes are inoculated with any dilution. The double strength tubes are inoculated with 10 mL of sample and the single strength tubes are inoculated with 1 mL sample.

The 16646-3 ISO Standard states an incubation of the inoculated tubes at 37°C for 24 ± 2 hours. Tubes that changes the colour to yellow due to acid production (positive reaction) are then selected. A loop from the positive tubes is streaked onto TBX Agar plates and incubating at 44°C for 20-24 hours. For the MPN result tubes are considered positive if blue or blue-green colonies on the TBX Agar, showing the presence of b-glucuronidase-positive *E. coli*.

If a coliform or *E. coli* presumptive MPN enumeration is to be performed, all tubes showing a colour change and gas production in 24-48 hours must be considered positive. Gas production can be detected in the Durham tube or by effervescence when the tube is tapped.

Limitations of the Procedure

- The results are influenced by the medium pH. Before inoculation it must be verified that the sterilization process has not changed the pH value.

- In spite of the selectivity of the medium, it is possible that some non-coliform organism can grow producing acid and gas. All the presumptive results must be confirmed before expressing them as "coliforms" or "*E. coli*".



Reference : 02-656

Scharlau Microbiology - Technical data sheet

Product :
MINERAL MODIFIED GLUTAMATE MEDIUM BASE**Quality control****Incubation temperature:** 37°C ± 1**Incubation time:** 24±2h**Inoculum:** 100 CFU Min. 50 CFU (Productivity) / 10⁴-10⁶ CFU (Selectivity) according to ISO 11133:2014/Amd 1:2018

Microorganism	Growth	Remarks
<i>Enterococcus faecalis</i> ATCC® 19433	Inhibited	-
<i>Escherichia coli</i> ATCC® 8739	Good	Yellow medium
<i>Escherichia coli</i> ATCC® 25922	Good	Yellow medium
<i>Enterococcus faecalis</i> ATCC® 29212	Inhibited	-

References

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- ISO 11133:2014/ Adm 1:2018. Microbiology of food, animal feed and water. Preparation, production, storage and performance testing of culture media.
- ISO/TS 16649-3 (2017) Microbiology of food and animal feeding stuffs - Horizontal method for the enumeration of β -glucuronidase-positive *Escherichia coli* - Part 3: Most probable number technique using 5-bromo-4-chloro-indolyl- β -D-glucuronide.
- JOINT COMMITTEE of the PHLS and the STANDING COMMITTEE of ANALYSIS (1980) A comparison between Minerals Modified Glutamate Medium and Lauryl Tryptose Lactose Broth for the enumeration of *E. coli* and coliform organisms in water by the multiple tube method. J. Hyg. Camb. 85:35-48.
- MANAFI, M. (2003) Media for the detection and enumeration of "total" Enterobacteriaceae, coliforms and *Escherichia coli* from water and foods. In "Handbook of Culture Media for Food Microbiology". J.E.L. Corry et al. (eds). Elsevier Science B. V. Amsterdam.
- MOUSSA, R.S., N. KELLER, G. CURIAT & J.C. de MAN ((1973) Comparison of five media for the isolation of coliform organisms from dehydrated and deep-frozen foods. J. Appl. Bact. 36:619-624.
- PHLS STANDING COMMITTEE on the BACTERIOLOGICAL EXAMINATION of WATER SUPPLIES (1968) A comparison of MacConkey Broth, Teepol Broth and Glutamic Acid Media for the enumeration of coliform organisms in water. J. Hyg. Camb. 66:67-82.

Storage

For laboratory use only. Keep tightly closed, away from bright light, in a cool dry place (+4 °C to 30 °C).