

MALONATE BROTH

For the differentiation of *Enterobacteriaceae*
on the basis of their ability to utilise sodium malonate.

TYPICAL FORMULA (g/l)

Yeast Extract	1.000
Ammonium Sulphate	2.000
Potassium Phosphate	1.000
Sodium Chloride	2.000
Sodium Malonate	3.000
Brom Thymol Blue	0.025
Glucose	0.250

DIRECTIONS

Suspend 9.3g in 1000ml of cold distilled water, heat to dissolve, distribute into tubes and sterilise by autoclaving at 121 °C for 15 minutes. All glassware must be chemically cleaned and alkali-free.

Final pH 6.7 ± 0.1

DESCRIPTION

Malonate Broth is used to differentiate *Enterobacteriaceae* on the basis of their ability to utilise sodium malonate as the only source of carbon for their growth. The medium prepared according to the formulation of Leifson, modified by Edwards and Ewing, contains sodium malonate as the only source of carbon and ammonium sulfate as a source of nitrogen. Malonate inhibits Krebs cycle by competition with succinic acid, blocking the succinic dehydrogenase activity and glyoxylic cycle by inhibition of isocitratase enzyme, which converts isocitric acid to glyoxylic acid and succinic acid. Sodium malonate inhibits the growth of all the organisms except for those that are able to utilise it as a source of carbon.

On the basis of this data Leifson proposed a medium, Malonate Broth, for the growth and differentiation of malonate- utilising organisms.

TECHNIQUE

Inoculate the medium with a loopful of pure cultures. Incubate at 37°C for 18-24 hours and then observe the colour change of the medium in tubes.

The bacteria, which use sodium malonate as a sole source of carbon, utilise also ammonium sulphate as a source of nitrogen causing an alkalisation of the medium with a colour change of bromothymol blue from green to Prussian blue. The medium is suitable for the differentiation of *S. arizonae* (+) from *Salmonella spp.* (-) *Klebsiella Enterobacter group* (+) from *E.coli* (-) and *Serratia* (-) as well as *Klebsiella* (+) from *Actinobacillus* (-).

User quality assurance (37°C - 48hrs)

Malonate positive control: *K.pneumoniae* ATCC 23357

Malonate negative control: *E.coli* ATCC 25922

Storage

Dehydrated medium: 10-30°C

User prepared tubes: 7 days at 2-8°C

REFERENCES

- Edwards, P.R. & Ewing, W.H. (1972) - Identification of Enterobacteriaceae. 3rd edition, Minneapolis: Burgess Publishing Company.
- Leifson, E. (1933) - J. Bacteriol., **26**, 329.
- Mac Faddin, J. F. (1976) - Biochemical Tests for Identification of Medical Bacteria. Baltimore: The Williams & Wilkins Company

Packaging

4016852 Malonate Broth 500g (53.8 l)