

THIOGLYCOLLATE BROTH

INTENDED USE: is used for the cultivation of anaerobic microorganisms.

SUMMARY AND EXPLANATION OF THE TEST: Quastel and Stephenson found the presence of small amounts of a compound containing an –SH group (cysteine, thioglycolic acid, and glutathione) permitted “aerobic” growth of *Clostridium sporogenes*.¹ Falk, Bucca, and Simmons discovered the advantages of using small quantities of agar in detecting contaminants during sterility testing.² Brewer demonstrated the value of a small amount of agar and a reducing substance in this medium.³

Thioglycollate Broth is used for cultivating and detecting microorganisms in normally sterile materials, especially those containing mercurial preservatives when the oxidation-reduction indicator is not present or required. Thioglycollate Broth is the medium of choice for diagnostic testing, where lack of an indicator avoids possible toxicity to organisms.⁴

PRINCIPLES OF THE PROCEDURE: Thioglycollate Broth supports the growth of a large variety of fastidious microorganisms having a wide range of growth requirements. The nitrogen, vitamin, and carbon sources are provided by Tryptone and Yeast Extract. Glucose is the carbohydrate energy source, and Sodium Chloride maintains the osmotic balance of the medium. Sodium Thioglycollate and L-Cystine lower the oxidation-reduction potential of the medium by removing oxygen to maintain a low Eh. By creating an environment with a low Eh, the reducing agents prevent the accumulation of peroxides that can be toxic to some organisms. The sulfhydryl groups (-SH) of these compounds also neutralize the antibacterial effect of mercurial preservatives, making thioglycollate media useful in testing material containing heavy metals. Agar eliminates the need for seals because it retards dispersion of CO₂, diffusion of oxygen, and reducing substances.⁵

FORMULA/LITER:

Tryptone.....	15,0 g
L-Cysteine	0,5 g
Glucose.....	5,5 g
Yeast Extract.....	5,0 g
Sodium chloride.....	2,5 g
Sodium thioglycollate.....	0,5 g
Resazurin.....	0,001 g
Agar.....	0,75 g

FINAL pH: 7,1 ± 0,2 at 25°C.

PRECAUTIONS:

1. For Laboratory Use.
2. Harmful if swallowed, inhaled, or absorbed through the skin. Irritating to eyes, respiratory system, and skin.

DIRECTIONS:

1. Dissolve 29.5 g of the medium in one liter of purified water.
2. Heat with frequent agitation to completely dissolve the medium.
3. Autoclave at 121 °C for 15 minutes. Cool to room temperature.

NOTE: The prepared medium should be reduced prior to inoculation. The prepared tubes should be boiled (with caps loose) for 3 - 5 minutes and cooled before use. Alternatively, the tubes can be placed in an anaerobic environment for at least 3 hours before use.

QUALITY CONTROL SPECIFICATIONS:

Dehydrated Appearance: Powder is homogeneous, free flowing and light beige.

Prepared Appearance: Prepared medium is clear to hazy, yellow, with no to light precipitate.

Expected Cultural Response: Cultural response in Thioglycollate Broth incubated aerobically at 35 ± 2°C and examined for growth at 24 – 72 hours.

Microorganism	Response
<i>Bacillus subtilis</i> ATCC® 6633	good growth
<i>Bacteroides vulgatus</i> ATCC® 8482	good growth
<i>Candida albicans</i> ATCC® 10231	good growth
<i>Clostridium sporogenes</i> ATCC® 11437	good growth
<i>Micrococcus luteus</i> ATCC® 9341	good growth

Typically growth is visually observed in the media. Gram-negative bacilli usually grow diffusely, Gram-positive cocci exhibit puff-ball type growth and strict aerobes, such as Pseudomonads and yeast, grow in a thin layer on the surface of the medium.

STORAGE: ready to use tubes – 6-12°C;
bottles – 6-25°C;
dehydrated medium – 3-20°C.

PACKAGING: cat No. 3038 bottle (100; 200; 500 ml);
cat No. 6040 tubes (screw cap, 10 ml);
cat No. 128 dehydrated medium (500 g).

EXPIRATION: bottles and tubes –360days;
dehydrated medium – 3 years.

REFERENCES:

1. Quastel and Stephenson. 1926. General biological products standards. Fed. Regist. 21:6109-12.
2. Falk, C. R., H. Bucca, and M. P. Simmons. 1939. A comparative study of the use of varying concentrations of agar in the test medium used to detect contaminants in biological products. J. Bacteriol. 37:121-131.
3. Brewer, J. H. 1940. Clear liquid mediums for the “aerobic” cultivation of anaerobes. J. Amer. Med. Assoc. 115:598-600.
4. Harmon, S. M., D. A. Kautter, D. A. Golden, and E. J. Rhodehamel. 1995. Clostridium perfringes, p. 16.01-16.06. In Bacteriological analytical manual, 8th ed. AOAC International, Gaithersburg, MD.
5. MacFaddin, J. F. 1985. Media for isolation-cultivation-identification maintenance of medical bacteria, vol. 1, p. 755-762. Williams & Wilkins, Baltimore, MD.



Graso Biotech
Krag 4A, 83-200 Starogard Gdański
Customer service: 58 562 30 21, fax. 58 562 79 87,
zamowienia@graso.com.pl; www.podloza.pl, www.grasobiotech.pl