FLUID THIOGLYCOLLATE MEDIUM (7137)

Intended Use

Fluid Thioglycollate Medium is used for sterility testing. This formula conforms to the US Pharmacopeia (USP).[1]

Product Summary and Explanation

Quastel and Stephenson[2] found that the presence of small amounts of a compound containing an –SH group (cystein, thioglycollic acid and glutathione) permitted "aerobic" growth of *Clostridium sporogenes*. Falk, Bucca and Simmons,[3] discovered the advantages of using small quantities of agar in detecting contaminants during sterility testing. The value of a small amount of agar and a reducing substance was demonstrated by Brewer.[4]

Fluid Thioglycollate Medium is also referred to as Thioglycollate Medium, and abbreviated FTM. Fluid Thioglycollate Medium is prepared according to the formula specified in the FDA Bacteriological Analytical Manual (BAM),[5] and the AOAC Official Methods of Analysis[6] for the examination of food, and sporicidal effects of disinfectants. FTM is recommended for sterility checks on banked blood,[7] and blood cultures.[8]

Principles of the Procedure

Fluid Thioglycollate Medium supports the growth of a large variety of fastidious microorganisms having a wide range of growth requirements. The nitrogen, vitamin, and carbon source is provided by Enzymatic Digest of Casein and Yeast Extract. 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.

Resazurin is the oxidation indicator. In the oxidized state, resazurin turns pink. In the reduced state resazurin is colorless. Dextrose is included in this formula to enhance organism growth. Sodium Chloride maintains the osmotic balance of the medium. The requirement for a sealed environment is eliminated with the addition of Agar, which retards dispersion of CO_2, diffusion of oxygen, and reducing substances.[9]

Formula / Liter

Enzymatic Digest of Casein	15 g
Yeast Extract	5 g
Dextrose	5.5 g
L-Cystine	0.5 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

Formula may be adjusted and/or supplemented as required to meet performance specifications.

Precaution

1. For Laboratory Use.

Directions

1. Suspend 29.8 g of the medium in one liter of purified water.
2. Heat with frequent agitation and boil for one minute to completely dissolve the medium.
3. Autoclave at 121°C for 15 minutes. Cool to room temperature.

NOTE: Unless used on the same day of preparation, the prepared tubes should be boiled (with caps loose) for 3 - 5 minutes and cooled before use.

Quality Control Specifications

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

Prepared Appearance: Prepared medium is clear to slightly hazy, and light amber in color with a pink upper layer. If the pink layer is greater than 10% of the tube, the medium may be restored once by heating in a steam bath until the pink color disappears.

Expected Cultural Response: Cultural response at an inoculum level of 1 – 100 cfu's at 35°C after 2 - 7 days incubation.

Microorganism	Response
Bacillus subtilis ATCC® 6633	growth
Bacteroides vulgatus ATCC® 8482	growth
Candida albicans ATCC® 10231	growth
Micrococcus luteus ATCC® 9341	growth

The organisms listed are the minimum that should be used for quality control testing.

Test Procedure

Refer to appropriate references for specific procedures using Fluid Thioglycollate Medium.

Results

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

Storage

Store the sealed bottle containing the dehydrated medium at 2 - 30°C. Once opened and recapped, place the container in a low humidity environment at the same storage temperature. Protect from moisture and light by keeping container tightly closed.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if it is not free flowing, or if the appearance has changed from the original color. Expiry applies to medium in its intact container when stored as directed.

Limitations of the Procedure

Due to nutritional variation, some strains may be encountered that grow poorly or fail to grow on this medium.

Packaging

Fluid Thioglycollate Medium	**Code No.**	**7137A**	**500 g**
		7137B	**2 kg**
		7137C	**10 kg**

References

1. **The United States Pharmacopeial Convention.** 1995. The United States pharmacopeia, 23rd ed. The United States Pharmacopeial Convention Inc. Rockville, MD.
2. **Quastel and Stephenson.** 1926. General biological products standards. Fed. Regist. **21**:6109.12.
3. **Falk, C. R., H. Bucca, and M. P. Simmons.** 1939. A comparative study of the use of varying concentrations of agar in the the medium used to detect contaminants in biological products, J. Bacteriol. **37**:121-131.
4. **Brewer, J. H.** 1940. Clear liquid mediums for the "aerobic" cultivation of anaerobes. J. Amer. Med. Assoc. **115**:598-600.
5. **Food and Drug Administration.** Bacteriological analytical manual, 8th ed., AOAC International, Gaithersburg, MD.
6. **Association of Official Analytical Chemists.** 1995. Official Methods of Analysis of AOAC International, 16th ed. AOAC International, Arlington, VA.
7. **Federal Register.** 1992. Additional standard for human blood and blood products. Fed Regist. **21**:640.2.17.
8. **Isenberg, H. D. (ed.).** 1992. Clinical microbiology procedures handbook, vol. 1, American Society for Microbiology, Washington, D.C.
9. **MacFaddin, J. F.** 1985. Media for isolation-cultivation-identification maintenance of medical bacteria, vol.1, p. 755-762. Williams & Wilkins, Baltimore, MD.

Technical Information

Contact Acumedia Manufacturers, Inc. for Technical Service or questions involving dehydrated culture media preparation or performance at (410)780-5120 or fax us at (410)780-5470.