

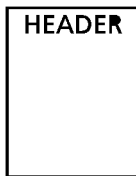
Revisions

SO 0191-5

Rev from	Rev to	ECO #
0503	0409	5080-09

Notes:

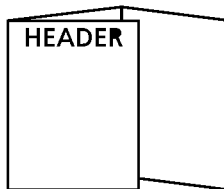
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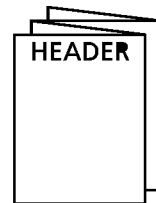
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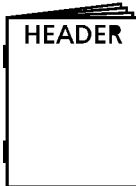
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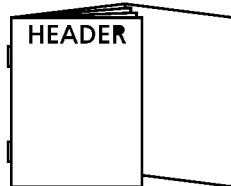
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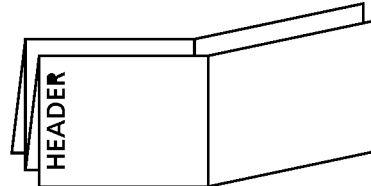
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BD BBL™ Prepared Tubed Media for the Cultivation of Anaerobic Microorganisms Thioglycollate Media

8807191JAA
2009/04

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INTENDED USE

Fluid Thioglycollate Medium Enriched and Enriched Thioglycollate Medium, PR II (pre-reduced medium in Hungate tubes) are general-purpose media for the cultivation of a wide variety of microorganisms, particularly obligate anaerobes.

Thioglycollate Medium with Calcium Carbonate and Enriched Thioglycollate Broth with Sodium Bicarbonate and Fildes Enrichment are also recommended for the maintenance of stock cultures.

SUMMARY AND EXPLANATION

Thioglycollate Medium was originally described by Brewer as a medium favoring the growth of obligately anaerobic as well as aerobic organisms.¹ Subsequently, several versions of the medium were formulated.

Enriched thioglycollate media are for use in the isolation and cultivation of fastidious or slow growing, obligately anaerobic microorganisms present in clinical material.

The incorporation of calcium carbonate or sodium bicarbonate is recommended because otherwise fastidious organisms may grow and then die off rapidly; they serve to neutralize acid produced during growth.^{2,3}

PRINCIPLES OF THE PROCEDURE

Casein and soy peptones and L-cystine provide amino acids and other nitrogenous substances to support bacterial growth. Yeast extract provides the B-complex vitamins. Sodium chloride provides essential ions. Dextrose is an energy source.

Enriched media are supplemented with hemin and vitamin K₁ for enhanced growth of certain anaerobic bacteria.³⁻⁵

Calcium carbonate and sodium bicarbonate enhance the maintenance of stock cultures by neutralizing acids produced during growth.³

Fildes Enrichment, a peptic digest of defibrinated sheep blood rich in growth factors, enhances the growth of fastidious organisms.

The reducing action provided by sodium thioglycollate and sodium sulfite binds molecular oxygen, thereby maintaining a low Eh.⁶ A small amount of agar is added to retard the absorption of oxygen by reducing convection currents in the medium.⁶ In addition, the pre-reduced medium provides an anaerobic nitrogen and hydrogen atmosphere; the tubes are packaged under oxygen-free conditions and sealed to maintain anaerobiosis.

Resazurin is an indicator used for detecting changes in Eh.³ Increased oxidation raises the Eh, causing the resazurin to become pink. The indicator remains colorless if the Eh remains low.

REAGENTS

Fluid Thioglycollate Medium, Enriched

Approximate Formula* Per Liter Purified Water

Pancreatic Digest of Casein	15.0 g
L-Cystine	0.5 g
Dextrose	5.0 g
Yeast Extract	5.0 g
Sodium Chloride	2.5 g
Sodium Thioglycollate	0.5 g
Resazurin	0.001 g
Agar	0.75 g
Hemin	0.1 g
Vitamin K ₁	2.0 mg

Thioglycollate Medium with Calcium Carbonate

Approximate Formula* Per Liter Purified Water

Pancreatic Digest of Casein	17.0 g
Papaic Digest of Soybean Meal	3.0 g
Dextrose	6.0 g
Sodium Chloride	2.5 g
Sodium Thioglycollate	0.5 g
Agar	0.7 g
Sodium Sulfite	0.1 g
Marble Chip	1 per tube

Enriched Thioglycollate Medium, PR II

Approximate Formula* Per Liter Purified Water

Pancreatic Digest of Casein	17.0 g
Papaic Digest of Soybean Meal	3.0 g
Dextrose	6.0 g
Sodium Chloride	2.5 g
Sodium Thioglycollate	0.5 g
Agar	0.7 g
L-Cystine	0.25 g
Sodium Sulfite	0.1 g
Hemin	5.0 mg
Vitamin K ₁	1.0 mg

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

Enriched Thioglycollate Broth with Sodium Bicarbonate and Fildes consists of Enriched Thioglycollate Medium, (PR II) provided in standard D tubes and supplemented with an additional 0.25 mg/L of Vitamin K₁, 0.5 g/L of sodium bicarbonate and approximately 25.0 mL of Fildes Enrichment.

Warnings and Precautions: For *in vitro* Diagnostic Use.

Caution should be exercised in reporting direct Gram stain and/or other direct microbiological stain results on tissue specimens processed with this medium due to the possible presence of nonviable organisms in the culture medium.

Pathogenic microorganisms, including hepatitis viruses and Human Immunodeficiency Virus, may be present in clinical specimens. "Standard Precautions"⁷⁻¹⁰ and institutional guidelines should be followed in handling all items contaminated with blood and other body fluids.

Tubes with tight caps should be opened carefully to avoid injury due to breakage of glass.

Storage Instructions: On receipt, store tubes in the dark according to label directions. Avoid freezing and overheating. Do not open until ready to use. Minimize exposure to light. Tubed media stored as labeled until just prior to use may be inoculated up to the expiration date and incubated for recommended incubation times. Allow the medium to warm to room temperature before inoculation.

Product Deterioration: Do not use tubes if they show evidence of microbial contamination, evaporation or other signs of deterioration.

For Fluid Thioglycollate Medium, Enriched, discard tubes if greater than one-third of the medium becomes oxidized, as indicated by the formation of pink discoloration.

SPECIMEN COLLECTION AND HANDLING

These media are not intended for use directly with specimens, except as a "back up" enrichment broth in addition to primary plating media. Consult appropriate texts for information.^{4,11,12}

PROCEDURE

Material Provided: as ordered (see "AVAILABILITY").

Materials Required But Not Provided: Ancillary culture media, reagents, quality control organisms and laboratory equipment as required for this procedure.

Test Procedure: Observe aseptic techniques.

A. Enriched Thioglycollate Medium, (PR II).

Before inoculating, disinfect the septum of the cap. To inoculate, insert needle through the septum and inject the specimen into the medium. Withdraw the needle slowly to avoid introducing air into the tube.

B. Other Tubed Thioglycollate Media.

Media for anaerobic incubation should be reduced prior to inoculation by placing the tubes, with caps loosened, under anaerobic condition for 18 to 24 h prior to use. An efficient and easy way to obtain suitable anaerobic conditions is through the use of the GasPak™ EZ anaerobic system. Alternatively, with the exception of Enriched Thioglycollate Broth with Sodium Bicarbonate and Fildes Enrichment, liquid media may be reduced immediately prior to use by boiling, with caps loosened, and cooling, with tightened caps, to room temperature before inoculation. **NOTE:** For optimum performance, do not boil tubes more than once.

Inoculate the specimen into the media of choice as soon as it arrives in the laboratory. With liquid specimens, tubed media should be inoculated with one or two drops of the specimen. Tissue specimens should be minced and ground in sterile, reduced broth such as Enriched Thioglycollate Medium for the cultivation of microorganisms. Inoculation is then performed as for liquid specimens. Swab specimens may be inserted into the broth after inoculation of plated media. Alternatively, the swab may be "scrubbed" in a small volume of sterile, reduced broth such as Enriched Thioglycollate Medium and the broth used to inoculate media as performed with liquid specimens.

Specimens known or suspected to contain obligate anaerobes should be inoculated near the bottom of the tube. Incubate at 35 ± 2°C or other appropriate temperature, preferably under anaerobic conditions.

Broth cultures should be held at least 1 week before discarding as negative.

User Quality Control:

- Examine the tubes for signs of deterioration as described under "Product Deterioration."
- Check performance by inoculating a representative sample of tubes with pure cultures of stable control organisms that give known, desired reactions. The following cultures are recommended:

Medium	Test Strain	Expected Results
All media	<i>Bacteroides vulgatus</i> ATCC™ 8482	Growth
	<i>Clostridium perfringens</i> ATCC 13124	Growth

Quality control requirements must be performed in accordance with applicable local, state and/or federal regulations or accreditation requirements and your laboratory's standard Quality Control procedures. It is recommended that the user refer to pertinent CLSI guidance and CLIA regulations for appropriate Quality Control practices.

RESULTS

Growth is indicated by the presence of turbidity compared to an uninoculated control.

Examine growth by Gram staining. Subculture onto appropriate selective and nonselective plating media.

LIMITATIONS OF THE PROCEDURE


Enrichment broths should not be used as the sole isolation medium. They are intended to be used in conjunction with selective and nonselective plating media to increase the probability of isolating pathogens, especially when they may be present in small numbers.

For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.^{4,11,13-16}

PERFORMANCE CHARACTERISTICS

Prior to release, all lots of Fluid Thioglycollate Medium, Enriched are tested for performance characteristics. Before inoculation, representative samples of the lot are reduced by boiling in a water bath for a minimum of 10 min and cooled. Using a 0.01 mL calibrated loop, tubes are inoculated with cultures that have been adjusted to a 0.5 McFarland turbidity standard. The inocula for *Porphyromonas levii* (ATCC 29147), *Clostridium perfringens* (ATCC 13124) and *Peptostreptococcus anaerobius* (ATCC 27337) are prepared from colonies grown on CDC Anaerobe 5% Sheep Blood Agar plates and adjusted to the correct inoculum concentration in pre-reduced Thioglycollate Medium, Enriched. The inoculum for *Bacteroides vulgatus* (ATCC 8482) is taken from Thioglycollate Medium, Enriched and the inoculum for *C. novyi* (ATCC 7659) is taken from Chopped Meat Glucose Broth, PR II. Tubes are inoculated below the surface of the broths as deeply into the medium as possible. The caps are tightened immediately after inoculation and the tubes are incubated aerobically a 35 ± 2°C. Tubes are read for the amount of growth after 18 to 24 h and 42 to 48 h. All organisms show trace to heavy growth after 48 h.

AVAILABILITY

Cat. No.	Description
297642	BBL™ Fluid Thioglycollate Medium, Enriched, Ctn. of 100 size K tubes. 
298518	BBL™ Thioglycollate Medium with Calcium Carbonate, Ctn. of 100 size K tubes.
297857	BBL™ Enriched Thioglycollate Medium, PR II, Ctn. of 100 size K tubes.
299794	BBL™ Enriched Thioglycollate Broth with Sodium Bicarbonate and Fildes, Ctn. of 100 size D tubes.

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