HEART INFUSION FERMENTATION BASE MEDIA

PURPOSE:

Plate and Tube Media[a]

Heart Infusion Broth With Bromcresol Purple Indicator and 1% Carbohydrate, item no. adonitol T6582, arabinose T6584, cellobiose T6585, dextrose T6586, inositol T6590, inulin T6591, lactose T6592, maltose T6594, mannitol T6596, raffinose T6598, rhamnose T6600, salicin T6602, sorbitol T6604, sucrose T6606, trehalose T6609, xylose T6608

[a]see catalog for ordering options

PURPOSE:

Heart infusion base media, with either bromcresol purple or phenol red indicator, are used to determine the ability of bacteria to utilize specific carbohydrates. Bromcresol purple base media are used for the speciation of streptococci and are used by the Centers for Disease Control (CDC) when identifying *Corynebacterium diphtheriae*.[7]

PRINCIPLE:

Heart infusion base medium, in which the intrinsic fermentable components have been destroyed, is highly nutritious and supports the growth of a wide spectrum of bacteria. In addition to the heart infusion, it contains a complementary mixture of animal and vegetable peptones, primarily the pancreatic digest of casein, which serves as a rich source of amino acids. With the addition of a specific carbohydrate, microbial enzymes, if present, degrade the carbohydrate producing sufficient metabolic acids to change the bromcresol indicator or the phenol red indicator to yellow. Use of this highly nutritious medium has proven effective in determining the capability of streptococci to ferment a variety of carbohydrates. It appears that the streptococci do not utilize the intrinsic fermentable components that may be present in yeast extract or the peptic digest of animal tissue[7] Bromcresol purple indicator, which is less sensitive than phenol red indicator,[7] appears to obscure the false-positive reactions associated with fermentation media containing peptones and extracts.[7]

FORMULAS:

Approximate, per liter of deionized filtered water.

(1) Heart Infusion Agar With Bromcresol Purple:

Beef Heart Infusion Solids	2.0 g
Pancreatic Digest of Casein	11.0
Peptic Digest of Animal Tissue	5.0
Yeast Extract	2.0
Sodium Chloride	5.0
Specific Carbohydrate	10.0
Bromcresol Purple	30.4 mg

Final pH 7.3 ± 0.2 at 25°C

PRECAUTIONS:*

For in vitro diagnostic use. Observe approved biohazard precautions.

Storage: Upon receipt store at 2-8°C away from direct light. Media should not be used if there are signs of contamination, deterioration (evaporation, shrinking, cracking, or discoloration), or if the expiration date has passed.

Limitations: Carbohydrate utilization is not sufficient for definitive identification; additional biochemical and/or serologic testing is necessary.

Viridans streptococci are sensitive to different pH indicators and different bases, and ultimately different speciation designations will occur if broths other than bromcresol purple broth are used.

PROCEDURE:*

Specimen Collection: Not applicable since these media are not for primary isolation. These media are used in characterizing pure cultures. Isolated organisms, established isolation techniques, and tests for purity are necessary before inoculating these media. Direct inoculation of specimens will produce erroneous results. Information on specimen collection may be found in standard reference texts.

Method of Use, Tube: Prior to inoculation, the medium should be brought to room temperature. Inoculate the broth with colonies growing from a 18- to 24-hour pure culture or with well-isolated colonies. A suspension of microbes can be made in a sterile saline and used to inoculate a battery of carbohydrates. Incubate aerobically at 35°C and examine daily for 3-5 days. It may be necessary to incubate the broth for up to 30 days before considering the test negative. See "Interpretation" below.

Method of Use, Plate: Using a 18- to 24-hour growth from a pure culture or from well-isolated colonies growing in a mixed culture, prepare a microbial suspension in sterile saline. Deposit a broth spot 5-6 millimeters in diameter onto the surface of the agar plate using the multipoint inoculation system or any comparable device. Incubate aerobically at 35°C for 18-24 hours and examine the area surrounding the broth spot.

Interpretation:

Positive: Production of a yellow color. The organism utilizes the carbohydrate present.
Negative: No color change.

Material Required but Not Provided: Standard microbiological supplies and equipment such as incubators, inoculating loops, pipettes, sterile saline or broth, and the multipoint inoculation system are not provided.

QUALITY CONTROL:*

Heart Infusion Media:	Microorganisms Used (ATCC#)	Expected Results:**
Adonitol	*Enterobacter aerogenes* (13048)	(+)
	Escherichia coli (25922)	(-)
Arabinose, Raffinose	*Enterobacter aerogenes* (15046)	(+)
Rhamnose, Melibiose	*Serratia marcescens* (8100)	(-)
Dextrose + Durham Tube	*Escherichia coli* (25922)	(+/gas)
	Moraxella osloensis (10973)	(- /no gas)
Inositol	*Enterobacter aerogenes* (13048)	(+)
	Escherichia coli (25922)	(-)
Lactose, Maltose	*Escherichia coli* (25922)	(+)
Mannitol, Mannose, Sorbitol	*Proteus mirabilis* (43071)	(-)
Base Control	*Klebsiella pneumoniae* (13883)	(-)
	Enterobacter aerogenes (13048)	(-)
Salicin, Sucrose	*Enterobacter aerogenes*(13048)	(+)
	Salmonella species	(-)
Trehalose	*Escherichia coli* (25922)	(+)
	Edwardsiella tarda (15947)	(-)
Cellobiose, Xylose	*Klebsiella pneumoniae* (13883)	(+)
	Morganella morganii (25830)	(-)
Inulin	*Streptococcus bovis* (9809)	(+)
	Streptococcus pyogenes (19615)	(-)
Glycoside	*Staphylococcus aureus* (25923)	(+)
	Escherichia coli (25922)	(-)
	Key: See "Interpretation"	

**All tubes appear cloudy, indicating signs of growth.

User Quality Control: Check for signs of contamination and deterioration.

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7. Vera, H. D., *Am. J. of Publ. Health*, 40:1267, 1950.

* For more detailed information, consult appropriate references and/or the details in preface of the PML Technical Manual.

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