Selenite Cystine Broth Base

M1079

Intended Use:

It is recommended as a selective enrichment media for *Salmonella* and possibly *Shigella sonnei* from faeces, urine, water and foodstuffs.

Composition**

Ingredients	Gms / Litre
Tryptone	5.000
Lactose	4.000
Disodium phosphate	10.000
L-Cystine	0.010
Final pH (at 25°C)	7.0±0.2

**Formula adjusted, standardized to suit performance parameters

Directions

Suspend 19.01 grams in 1000 ml purified / distilled water. Add 4 grams of sodium hydrogen selenite (M1079B). Warm to dissolve the medium completely. Distribute in sterile test tubes. Sterilize in a boiling water bath or free flowing steam for 10 minutes. DO NOT AUTOCLAVE. Excessive heating is detrimental. Discard the prepared medium if large amount of selenite is reduced (indicated by red precipitate at the bottom of tube/bottle).

Note : Instead of M1079B , DD056 -Sodium Biselenite discs (1 disc per 10 ml of the medium) or DB001-Sodium Biselenite Bud (1 bud per 100ml of medium) can be added to the medium after boiling.

Principle And Interpretation

Klett (8) first demonstrated the selective inhibitory effects of selenite and Guth (4) used it to isolate *Salmonella* Typhi. Leifson fully investigated selenite and formulated the media. Selenite Cystine Medium is a modification of Leifsons (9) formula with added cystine (10). Modification of original composition and similar media are recommended by AOAC, APHA, USP etc (1,2,9-13). Enrichment media are routinely employed for detection of pathogens in faecal specimens as the pathogens are present in a very small number in the intestinal flora. Selenite Cystine Broth is useful for detecting Salmonella in the nonacute stages of illness when organisms occur in the faeces in low numbers and for epidemiological studies to enhance the detection of low number of organisms from asymptomatic or convalescent patients (7).

Tryptone provides nitrogenous and carbonaceous compounds, long chain amino acids, vitamins and other essential nutrients. Lactose maintains the pH of medium. Selenite is reduced by bacterial growth and alkali is produced. An increase in pH lessens the toxicity of the selenite and results in overgrowth of other bacteria. The acid produced by bacteria due to lactose fermentation serves to maintain a neutral pH. Sodium phosphate maintains a stable pH and also lessens the toxicity of selenite. L-cystine improves recovery of *Salmonella*.

Enriched broth is subcultured on differential plating media such as Bismuth Sulphite Agar (M027), Brilliant Green Agar (M016), XLD Agar (M031) etc. Do not incubate the broth longer than 24 hours as inhibitory effect of selenite decreases after 6 - 12 hours of incubation (3).

Type of specimen

Clinical : faeces, urine, water samples and foods

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (5,6).
For food and dairy samples, follow appropriate techniques for sample collection and processing as per guidelines (11,13).
For water samples, follow appropriate techniques for sample collection, processing as per guidelines and local standards.(2)
After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions

In Vitro diagnostic use only. Read the label before opening the container. Wear protective gloves/protective clothing/ eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Overheating of the medium leads to loss of selectivity of the medium.

2. Further isolation and biochemical tests must be carried out for confirmation.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance
Cream to light yellow homogeneous free flowing powder

Colour and Clarity of prepared medium
Cream to yellow coloured clear solution without any precipitate

Reaction
Reaction of 1.9% w/v of medium along with 0.4% w/v selenite aqueous solution at 25°C. pH : 7.0±0.2

pH
6.80-7.20

Cultural Response
Cultural characteristics observed with added sodium hydrogen selenite (M1079B) when subcultured on MacConkey Agar(M081) after an incubation at 35-37°C for 18-24 hours.

Cultural Response

Organism	Inoculum (CFU)	Recovery	Colour of colony
Cultural Response			
Escherichia coli ATCC 25922	50-100	none to poor (no increase in numbers)	pink with bile precipitate
Salmonella Choleraesuis ATCC 12011	50-100	good-luxuriant	colourless
Salmonella Typhi ATCC 6539	50-100	good-luxuriant	colourless
Salmonella Typhimurium ATCC 14028	50-100	good-luxuriant	colourless

Storage and Shelf Life

Store between 10-30°C in a tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label. On opening, product should be properly stored dry, after tightly capping the bottle in order to prevent lump formation due to the hygroscopic nature of the product. Improper storage of the product may lead to lump formation. Store in dry ventilated area protected from extremes of temperature and sources of ignition Seal the container tightly after use. Use before expiry date on the label.
Product performance is best if used within stated expiry period.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product.
Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (5,6).

Reference

1. AOAC, 1978, Bacteriological Analytic Manual, 5th ed., AOAC, Washington, DC
2. Baird R.B., Eaton A.D., and Rice E.W., (Eds.), 2015, Standard Methods for the Examination of Water and Wastewater, 23rd ed., APHA, Washington, D.C.
3. Chattopadhyay W. and Pilford J. N., 1976, Med.Lab. Sci., 33:191.
4. Guth F., 1926, Zbl. Bakt. I. Orig., 77:487.
5. Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.
6. Jorgensen,J.H., Pfaller , M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock., D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
7. Kelly, Brenner and Farmer, 1985, Manual of Clinical Microbiology, 4th ed., Lennett and others (Eds.), ASM, Washington, D.C.
8. Klett A., 1900, Zeitsch Für Hyg. Und. Infekt., 33: 137.
9. Leifson E., 1936, Am. J. Hyg., 24(2) : 423.
10. North W.R. and Bartran M.T., 1953, Appl. Microbiol., 1:130.
11. Salfinger Y., and Tortorello M.L. Fifth (Ed.), 2015, Compendium of Methods for the Microbiological Examination of Foods, 5th Ed., American Public Health Association, Washington, D.C.
12. United States Pharmacopoeia, 2002, USP 25/NF 20, Asian Edition, United States Pharmacopeial Convention, Inc., Rockville, MD.
13. Wehr H. M. and Frank J. H., 2004, Standard Methods for the Microbiological Examination of Dairy Products, 17th Ed., APHA Inc., Washington, D.C.

Revision : 02/ 2018

IVD	In vitro diagnostic medical device
CE	CE Marking
30°C / 10°C	Storage temperature
	Do not use if package is damaged
	HiMedia Laboratories Pvt. Limited, 23 Vadhani Industrial Estate, LBS Marg,Mumbai-86,MS,India
EC REP	CE Partner 4U ,Esdoornlaan 13, 3951 DB Maarn The Netherlands, www.cepartner 4u.eu