PRODUCT SPECIFICATION SHEET

Fluid Selenite Cystine Medium (Twin Pack) (DM475U)

Intended Use
Fluid Selenite Cystine Medium (Twin Pack) (DM475U) is recommended for enrichment and isolation of *Salmonella* from feces, urine, waterfoods and other materials of sanitary importance in compliance with USP.

Product Summary and Explanation
Salmonella are gram-negative, facultatively anaerobic, non-sporulating, non-motile rods in the family *Enterobacteriaceae*. They are widely distributed in animals affecting mainly the stomach and the intestines. *Salmonella* are injured during various food processing procedures, including exposure to low temperatures, submarginal heat, drying, radiation, preservatives or sanitizers.[12] Since, *Salmonella* may be present in low numbers in food sample in an injured condition; recovery of *Salmonella* involves pre-enrichment, selective enrichment and selective plating. Selenite Cystine Broth is useful for detecting *Salmonella* in the non-acute stages of illness when organisms occur in low numbers in test samples and for epidemiological studies to enhance the detection of low numbers of organisms from asymptomatic or convalescent patients.[1] Klett[2] first demonstrated the selective inhibitory effects of selenite. Guth[3] used it to isolate *Salmonella Typhi*. Further, Leifson studied selenite and formulated a medium. Fluid Selenite Cystine Medium is a modification of Leifsons[4] formula with added cystine by North and Bartram.[5] The formulation corresponds to that of recommended by the AOAC[6] for the detection of Salmonellae in foodstuff particularly egg products. It is included by APHA,[7,8] USP.[9] Recently ISO Committee also recommends this medium for the detection of Salmonellae.[10]

Principles of the Procedure
Fluid Selenite Cystine Medium (Twin Pack) contains pancreatic digest of casein provides nitrogenous substances. Lactose is the fermentable carbohydrate and maintains the pH in medium as selenite is reduced by bacterial growth and alkali is produced. An increase in pH lowers 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. Phosphate maintains a stable pH and also lessens the toxicity of selenite. L-cystine is the reducing agent, improving the recovery of *Salmonella*. Enriched broth is sub-cultured on solid medium. Do not incubate the broth longer than 24 hours as inhibitory effect of selenite reduces after 6 - 12 hours of incubation.[11]

Formula / Liter

Ingredients	Gms / Liter
Part A	
Pancreatic digest of casein	5.00
Lactose	4.00
Sodium phosphate	10.00
L-Cystine	0.01
Part B	
Sodium acid selenite	4.00
Final pH: 7.0 ± 0.2 at 25°C	
Formula may be adjusted and/or supplemented as required to meet performance specifications	

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Precautions

1. For Laboratory Use only.
2. IRRITANT. Irritating to eyes, respiratory system, and skin.
3. Sodium acid selenite (Sodium bi-selenite) is very toxic, corrosive agent and causes teratogenicity. Handle with great care. Upon contact with skin, wash immediately with a lot of water.

Directions

1. Suspend 4 grams of Part B in one liter of distilled water. Add 19.01 grams of Part A. Mix well.
2. Warm to dissolve the medium completely. Distribute in sterile test tubes.
3. Sterilize in a boiling water bath or free flowing steam for 10 minutes.
4. 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).

Quality Control Specifications

Dehydrated Appearance	Part A :Cream to yellow homogeneous free flowing powder Part B : Off-white to cream homogeneous free flowing powder
Prepared Medium	Light yellow coloured, clear to slightly opalescent solution of complete medium
Reaction of [(1.9% w/v) Part A and (0.4% w/v) Part B] Solution	pH : 7.0 ± 0.2 at 25°C
Gel Strength	Not Applicable

Growth Promotion Test

As per United States Pharmacopoeia

Expected Cultural Response: Cultural characteristics observed after enrichment in DM475U for 18-24 hours, and then subcultured on Xylose Lysine Deoxycholate Agar (DM297U) and Brilliant Green, Phenol red, lactose monohydrate Sucrose Agar(DM044U) and incubated at 35-37°C for 18-48hours.

Sr. No.	Organisms	Results to be achieved					
		Inoculum (CFU)	Growth	Observed Lot value (CFU)	Recovery	Colour of Colony	Incubation period
	Growth on Agar Medium L						
1.	*Salmonella Typhimurium ATCC 14028*	50-100	luxuriant	25 -100	>=50 %	pinkish white	24 -48 hrs
2.	*Salmonella Abony NCTC 6017*	50-100	luxuriant	25 -100	>=50 %	pinkish white	24 -48 hrs
	Growth on Agar Medium K						
3.	*Salmonella Enteritidis ATCC 13076*	50-100	luxuriant	25 -100	>=50 %	red with black centres	18 -24 hrs
4.	*Salmonella Typhimurium ATCC 14028*	50-100	luxuriant	25 -100	>=50 %	red with black	18 -24 hrs

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						centres	
5.	*Salmonella Abony NCTC 6017*	50-100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -24 hrs
6.	*Salmonella Typhi ATCC 6539*	50-100	good-luxuriant	25 -100	>=50 %	red with black centres	18 -24 hrs
7.	*Escherichia coli ATCC 8739*	50-100	Fair	10 -30	20 -30 %	yellow	18 -24 hrs
8.	*Escherichia coli ATCC 25922*	50-100	Fair	10 -30	20 -30 %	yellowish green	18 -24 hrs
9.	*Escherichia coli NCTC 9002*	50-100	Fair	10 -30	20 -30 %	yellowish green	24 -48 hrs
	Growth on Agar Medium L						
10.	*Salmonella Enteritidis ATCC 13076*	50-100	luxuriant	25 -100	>=50 %	pinkish white	24 -48 hrs
11.	*Salmonella Typhi ATCC 6539*	50-100	Fair- good	15 -40	30-40 %	reddish	24 -48 hrs
12.	*Escherichia coli ATCC 8739*	50-100	Fair	10 -30	20 -30 %	yellowish green	24 -48 hrs

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

Test Procedure

1. Enriched broth is sub cultured on solid medium. Do not incubate the broth longer than 24 hours as inhibitory effect of selenite reduces after 6 - 12 hours of incubation.[12]
2. Refer appropriate references for standard test procedures.

Results

Refer appropriate references and procedures for interpretation of results.

Storage

Store the sealed bottle containing the dehydrated medium at 10 - 30°C. Once opened and recapped, place container in a low humidity environment at the same storage temperature. Protect from moisture and light.

Expiration

Refer to the expiration date stamped on the container. The dehydrated medium should be discarded if 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

1. For identification, organisms must be in pure culture. Morphological, biochemical and/or serological tests should be performed for final identification.
2. Consult appropriate texts for detailed information and recommended procedures.

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Packaging
Product Name : Fluid Selenite Cystine Medium (Twin Pack)
Product Code : DM475U
Available Pack sizes : 100gm / 500gm

References

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11. Hartman P. A. and S. A., Munich, 1981, J. Food Pract., 44: 385-386.
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Further Information

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