OXFORD LAB FINE CHEM LLP
ISO 9001-2008 Certified Company

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Oxford
Range of
Laboratory Chemicals

TECHNICAL DATA SHEET

Triple Sugar Iron Agar (TSI Agar)

Principle

Triple sugar iron agar is designed to differentiate among organisms based on the differences in carbohydrate fermentation patterns and hydrogen sulfide production. Carbohydrate fermentation is indicated by the production of gas and a change in the color of the pH indicator from red to yellow. To facilitate the observation of carbohydrate utilization patterns, TSI Agar contains three fermentative sugars, lactose and sucrose in 1% concentrations and glucose in 0.1% concentration. Due to the building of acid during fermentation, the pH falls. The acid base indicator phenol red is incorporated for detecting carbohydrate fermentation that is indicated by the change in color of the carbohydrate medium from orange red to yellow in the presence of acids. In case of oxidative decarboxylation of peptone, alkaline products are built and the pH rises. This is indicated by the change in color of the medium from orange red to deep red. Sodium thiosulfate and ferrous ammonium sulfate present in the medium detects the production of hydrogen sulfide and is indicated by the black color in the butt of the tube. To facilitate the detection of organisms that only ferment glucose, the glucose concentration is one-tenth the concentration of lactose or sucrose. The meager amount of acid production in the slant of the tube during glucose fermentation oxidizes rapidly, causing the medium to remain orange red or revert to an alkaline pH. In contrast, the acid reaction (yellow) is maintained in the butt of the tube since it is under lower oxygen tension. After depletion of the limited glucose, organisms able to do so will begin to utilize the lactose or sucrose. To enhance the alkaline condition of the slant, free exchange of air must be permitted by closing the tube cap loosely.

Use: For identification of gram negative enteric bacilli on the basis of dextrose lactose & sucrose fermentation & hydrogen sulphide production.

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Contents*

Ingredients	Gram/Litre
Meat Extract#	3.000
Protease Peptone	5.000
Peptone	15.000
Yeast Extract	3.000
Lactose	10.000
Sucrose	10.000
Dextrose Monohydrate	1.000
Ferrous Sulphate	0.200
Sodium Chloride	5.000
Sodium Thiosulphate	0.300
Phenol Red	0.024
Agar	12.000
pH at 25ºC	7.4 ±0.2

***Formula adjusted for optimum performance and parameters #Equivalent to Beef extract**

Directions: Dissolve 64.50 grams in 1000 ml distilled water. Boil to dissolve the medium completely and distribute aseptically. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 min, kept in slight slanting position to form small slant with large butt. Ensure complete solidification and inoculate test sample aseptically.

Specimens' types analyzed

Pharmaceutical samples, clinical and non-clinical samples, water samples, soil samples, food and dairy samples etc.

Precautions to be taken

These microbial media are intended for the in-vitro use only. All the handling, experiments, storage, and discarding should be performed with the help of skilled and knowledgeable technicians and as per the established guidelines. The material should be disposed only after proper sterilization by autoclaving. Please go through the MSDS of the media to avoid any accidents or in emergency.

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Performance and Evaluation

The expected performance of the medium is liable to use as per the direction on the label when stored at optimum conditions and within expiry date.

Quality Control

Appearance	**Pink beige colored free flowing, homogeneous powder**
Reaction of 6.45% solution	**7.4 ±0.2 at 25 ˚C**
pH	**7.20- 7.60**
Gelling	**Firm comparable with 1.2% agar gel**
Color and clarity of ready medium	**Red, slightly opalescent gel with no significant precipitate.**
Growth Promotion properties	**Best at ≤ 100 CFU at 32-37 ºC for 18-72 h**
Indicative properties	**Optimum at ≤ 100 CFU at 32-37 ºC for 18-48 h**
Negative control	**Performed using sterile distilled water**

Different Microbial Response: Cultural characteristics observed after incubation at 33-37°C for 18-24 hours. Inoculum 50-100 CFU.

Organism	ATCC	Growth	Slant	Butt	Gas	H_2S production
Salmonella typhimurium	**14028**	**Luxuriant**	**Red color (alkaline reaction)**	**Yellow color (acidic reaction)**	**Positive reaction**	**Blackening of medium**
Salmonella paratyphi A	**9150**	**Luxuriant**	**Red color (alkaline reaction)**	**Yellow color (acidic reaction)**	**Positive reaction**	**Negative reaction**
Escherichia coli	**8739**	**Luxuriant**	**Yellow color (acidic reaction)**	**Yellow color (acidic reaction)**	**Positive reaction**	**Negative reaction**
Pseudomonas aeruginosa	**27853**	**Luxuriant**	**Red color (alkaline reaction)**	**Red color (alkaline reaction)**	**Negative reaction**	**Negative reaction**
Klebsiella aerogenes	**13048**	**Luxuriant**	**Yellow color (acidic reaction)**	**Yellow color (acidic reaction)**	**Positive reaction**	**Negative reaction**

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Storage and Shelf Life: The product is highly hygroscopic; keep the container tightly closed at all times and store it properly as per the conditions mentioned on the label. The declared expiry is valid only when stored as per the conditions mentioned on the label. Note: Sterilize media immediately after reconstitution.

Disposal: To avoid the contamination or propagation of any hazardous microbes the used, unusable or modified preparation of this product must be disposed after autoclaving after completion of task.

Reference

1. **Atlas, R. M. (2005). Handbook of media for environmental microbiology. CRC press.**
2. **Difco Manual (1998). 11th Edition. Difco Laboratories., Division of Becton Dickinson and Company, Sparks, Maryland, USA.**
3. **Rand, M. C., Arnold E. Greenberg, and Michael J. Taras, (1976), Standard methods for the examination of water and wastewater. Prepared and published jointly by American Public Health Association, American Water Works Association, and Water Pollution Control Federation.**

Disclaimer:

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