Also known as

SIM Agar

Specification

Differential medium for motility, H_2S production and indol formation.

Formula * in g/L

Yeast extract..... 10.0
Casein peptone..... 10.0
Meat peptone..... 6.0
Ferric-ammonium sulfate..... 0.2
Sodium thiosulfate.....0.2
Agar.....3.7

Final pH 7,3 ±0,2 at 25 ºC

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

Directions

Suspend 30 g of powder in 1 L of distilled water. Heat to boiling point and dispense into suitable containers. Sterilize in the autoclave at 121ºC for 15 minutes.

Description

This classical medium was originally developed to distinguish several types of enterobacteria, on the basis of the motility test, detection of indol and H_2S production.

It is a semisolid or fluid medium, and so the motile microorganisms can move freely. At the same time, the sulphur containing amino acids and the presence of thiosulfate allow those microorganisms that are able to, produce sulfides to do so, this then reacts with iron and produce black precipitates which in turn make the medium darker. The amount of thiosulfate present in medium does not affect the motility mechanisms, instead it ensures H_2S production by those microorganisms that are not able to produce it from cystine or cysteine.

Finally, the medium allows the production of indol from tryptophan present in the peptone, which can be easily detected with the addition of Kovacs' Reagent (directly or with extraction) or with paper strips impregnated with the reagent.

Technique

The recommended technique is to stab inoculate 2/3 of the distance to the bottom in the centre of the medium from a pure culture (or from an isolated colony). After an incubation period of 18± 2 hours at 37ºC±1, observe the stab. Non-motile microorganisms produce growth only in the stab, whereas motile ones may be easily detected by their displacement which is indicated by turbidity in the medium.

Production of H2S is indicated by a blackening of the media. A large amount of FeS will blacken the entire medium, while a small amount may only cause blackening around the stab.

Despite the fact that many authors suggest an extraction of indol by mixing the surface of the culture medium with chloroform, if Kovacs' Reagent is employed, then this is not necessary and the observations can be made by pouring a few drops of reagent on the surface of the medium. A positive test, will produce a colour change of purple/red in the interphase, whereas a negative test will produce no colour change. Chloroform extraction may give erroneous results, since the appearance of colour must be observed immediately after the addition of the reagent. However if it is delayed by more than 30 seconds, the test must be disregarded.

Quality control

Incubation temperature: 37°C ±1,0 **Incubation time:** 18 ± 2 h
Inoculum: Inoculation with pure culture by the method of stab

Microorganism	Growth	Remarks
Proteus mirabilis ATCC® 12453	Good	H2S (+) Mot (+) Indol (-)
Escherichia coli ATCC® 8739	Good	H2S (-) Mot (+) Indol (+)
Escherichia coli ATCC® 25922	Good	H2S (-) Mot (+) Indol (+)
Salmonella abony NCTC® 6017	Good	H2S (+) Mot (+) Indol (-)
Salmonella typhimurium ATCC® 14028	Good	H2S (+) Mot (+) Indol (-)
Shigella flexneri ATCC® 12022	Good	H2S (-) Mot (-) Indol (-)
Pseudomonas aeruginosa ATCC® 9027	Good	H2S (-) Mot (+) Indol (-)

Pseudomonas aeruginosa ATCC 9027
Salmonella ssp
Escherichia coli ATCC 25922

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Storage

For laboratory use only. Keep tightly closed, away from bright light, in a cool dry place (+4 ºC to 30 ºC).