



Reference : 01-192

Scharlau Microbiology - Technical data sheet

Product :

TRIPLE SUGAR IRON AGAR (TSI AGAR)

### Specification

Solid differential medium for the identification of enterobacteria according to ISO standards 6579, 6785 and 10272.

### Formula \* in g/L

Peptone .....	20.000	Iron(III) citrate .....	0.300
Meat extract .....	3.000	Sodium thiosulphate .....	0.300
Yeast extract .....	3.000	Phenol red .....	0.024
Lactose .....	10.000	Agar .....	12.000
Sucrose .....	10.000		
Dextrose .....	1.000	Final pH 7.4 ±0.2 at 25 °C	
Sodium chloride .....	5.000		

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

### Directions

Dissolve 64,6 g of powder in 1 L of distilled water and bring to the boil. Dispense into tubes and sterilize at 121°C for 15 minutes. Leave to solidify with short slants and good butts.

### Description

TSI Agar is a modification of the classical Kligler's agar. 1% sucrose has been added to this medium to differentiate *Proteus* and *Hafnia* (sucrose positive) from *Salmonella* and *Shigella* (sucrose negative).

Sugar degradation with acid formation is detected by turning an indicator (phenol red) to yellow, whereas alkalinization turns it to purple. When only glucose is degraded, the acid production is weak and is evaporated on the surface, so the indicator may be re-oxidised producing an alkaline surface (red) and an acid butt (yellow). If lactose or sucrose is degraded, acid production is intense and the entire medium (surface and butt) turns yellow. Gas production is detected by the formation of bubbles and occasionally cracks in the agar.

Hydrogen sulfide production, from thiosulfate or sulphured amino-acids from peptones, is detected by the formation of black FeS precipitate when the medium reacts with iron salts.

Use the medium in slanted tubes with a good butt and a short slant. Inoculate by streaking on the surface and stabbing deeply. It is advisable to use tubes with cotton plugs, in order to allow a re-oxidation of the indicator. If screw caps are used, they must be loose. See the following page for the table of reading (observations) and interpretation of results in TSI Agar.



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## Quality control

Incubation temperature: 37°C ±1,0

Incubation time: 24 ± 3h

Inoculum: Stab the butt and streak the slant. ≥ 10<sup>9</sup> CFU (specificity) according to ISO 11133:2014/Amd 1:2018 & Adm 2:2020

## Microorganism

*Shigella flexneri* ATCC® 12022*Proteus mirabilis* ATCC® 43071*Escherichia coli* ATCC® 25922*Salmonella typhimurium* ATCC® 14028*Salmonella enteritidis* ATCC® 13076*Shigella sonnei* ATCC® 9290*Pseudomonas aeruginosa* ATCC® 27853

## Growth

Good to very good

Good to very good

Good to very good

Good to very good

Good to very good

Good to very good

Good to very good

## Remarks

Slant:K; Butt:A; G(-); H2S (-)

Slant:K; Butt:A; G(-); H2S (+)

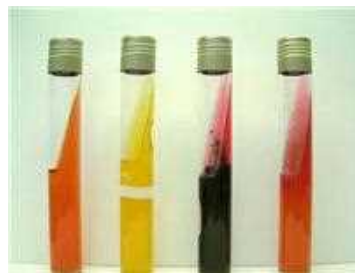
Slant:A; Butt:A; G(+); H2S (-)

Slant:K Butt:A; G(-); H2S (+)

Slant:K; Butt:A; G(D); H2S (+)

Slant:K; Butt:A; G(-); H2S (-)

Slant:K; Butt:K; G(-); H2S (-)



Left :Uninoculated tube / *E. coli* ATCC 25922  
Center :*Salmonella typhimurium* ATCC 14028  
Right: *Shigella sonnei* ATCC 9290

## References

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- ISO 6785 Standard (2001) Milk and milk Products - Detection of Salmonella spp.
- ISO 10272 Standard (1995) Microbiology of foods and animal feeding stuffs - Horizontal method for the detection of thermotolerant Campylobacter.
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- US PHARMACOPOEIA (2002) <61> Microbial Limit Tests. 25th ed. US Pharmacopeial Convention Inc. Rockville. Md. USA.

## Storage

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



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