Urea Agar Base (Christensen) ISO

Cat. 2180

For the differentiation of Enterobacteriaceae on the basis of urease production.

Practical information

Aplications	Categories
Confirmation	Salmonella
Differentiation	Enterobacteria

Industry: Water / Food

Regulations: ISO 19250 / ISO 6579

Principles and uses

Urea Agar Base (Christensen) may be used as an aid in the differentiation of microorganisms, particularly enteric Gram-negative Enterobacteria, on the basis of urea hydrolysis, from clinical samples and other materials. The formula is according to ISO 6579, and ISO 19250.

Urea Agar Base, with TSI Agar (Cat. 1046), may be used as a screening medium for the selection of Salmonella and Shigella. Urea Agar Base is used in spot tests for the rapid detection of urease activity and, when combined with results of other quick screening tests, it is the most common method to detect urease production by Enterobacteria. It is particularly recommended for the differentiation of members of the genus Proteus from those of Salmonella and Shigella in the diagnosis of enteric infections.

Gelatin peptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Dextrose is the fermentable carbohydrate providing carbon and energy. Sodium chloride maintains the osmotic balance. Monopotassium phosphate provides buffering capacity. Urea is a source of nitrogen for those organisms producing urease. Phenol red is the pH indicator.

Formula in g/L

Dextrose	1	Bacteriological agar	15
Gelatin peptone	1	Monopotassium phosphate	2
Phenol red	0,012	Sodium chloride	5

Preparation

Dissolve 24 grams of the medium in 950 ml of distilled water. Sterilize in autoclave at 121 ºC for 15 minutes. Cool to 50 ºC and add 50 ml of the Urea 40% Solution (Cat. 5100). Mix well and dispense aseptically in sterile tubes. Leave the medium to set in a slanted position so as to obtain deep butts. Do not overheat and do not remelt the slanted agar.

Instructions for use

For the confirmation of Salmonella according to ISO 6579 and ISO 19250:
- Streak the urea agar slant surface.

- Incubate at 37 ºC according to ISO to 6579, and 36±2 ºC according to ISO 19250, for up to 24 h and examine at intervals.
- If the reaction is positive, hydrolysis of urea liberates ammonia, which changes the colour of phenol red to rose-pink and later to deep cerise. The reaction is often apparent after 2 h to 4 h.
- Typical Salmonella cultures show a negative reaction, i.e. no colour production. Proteus and a few other organisms give a positive (purple) reaction.
- Reincubate all negative cultures daily for up to 7 days for positives such as Brucella.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rests	Fine powder	Orange-red	Light pinkish-yellow	6,8±0,2

Microbiological test

Incubation conditions: (35±2 ºC / 24±3 h).

Microorganisms	Specification	Characteristic reaction
Enterobacter aerogenes ATCC 13048	Good growth	Urease (-): no color change or yellow
Proteus vulgaris ATCC 13315	Good growth	Urease (+): red or purple medium
Klebsiella pneumonieae ATCC 13883	Good growth	Urease (+): red or purple medium
Salmonella typhimurium ATCC 14028	Good growth	Urease (-): no color change or yellow
Escherichia coli ATCC 25922	Good growth	Urease (-): no color change or yellow

Storage

Temp. Min.:2 ºC
Temp. Max.:25 ºC

Bibliography

Christensen J. Bact. 52:641. 1946. Thal and Chen J. Bact. 69:10. 1955. Ewing Enterobacteriaceae. USPHS, Publication 734.

ISO 6579. Microbiology of food and animal feeding stuffs. Horizontal method for the detection of Salmonella spp.

ISO 19250 water quality-detection of Salmonella spp