Urea Broth

Cat. 1226

For the differentiation of Enterobacteria, particularly Proteus from Salmonella and Shigella from clinical samples.

Practical information

Aplications	Categories
Confirmation	Enterobacteria
Differentiation	Enterobacteria

Industry: Water / Clinical / Food

Regulations: BAM

CE IVD

Principles and uses

Urea Broth can be used for the determination of the urea activity of Enterobacteriaceae, as well as microorganisms of the families of Brucella, Bacillus, Micrococcus, Mycobacteria and Proteus. It can be used for the identification of bacteria on the basis of urea utilization. It is especially recommended for the differentiation of members of the genus Proteus from those of Salmonella and Shigella.

Urea is a source of nitrogen for those organisms producing urease. Yeast extract is a source of vitamins, particularly of the B-group essential for bacterial growth. Potassium phosphates provide buffering capacity. Phenol red is the pH indicator.

When organisms utilize urea, ammonia is produced during incubation, making the reaction of these media alkaline. Positive urease tubes turn the phenol indicator a deep violet-red color (alkalinization). Therefore, urease production may be detected by a change in the phenol red indicator.

Developed by Rustigian and Stuart, this highly buffered medium usually reacts only to the high outputs of ammonia by Proteus, Morganella and Providencia in the first 24 hours of incubation.

Formula in g/L

Disodium phosphate	9,5	Monopotassium phosphate	9,1
Phenol red	0,01	Urea	20
Yeast extract	0,1		

Typical formula g/L * Adjusted and/or supplemented as required to meet performance criteria.

Preparation

Suspend 3,87 grams of the medium in 100 ml of distilled water without heating. When the powder is dissolved, sterilize by filtration. Dispense quantities of 0,5 to 2 ml in small sterile tubes. Larger volumes can be used but the reactions will be slower. Do not sterilize in autoclave. Do not boil the medium.

When there is no filter available, the medium can be sterilized at 100 -110°C for 10 minutes. If the medium is prepared and inoculated immediately it provides good results without sterilizing.

Instructions for use

For clinical diagnosis, the type of sample is bacteria isolated from urine and feces:
- Prepare a heavy suspension of the organism isolated from plated media and inoculate the Urea Broth tubes.
- Incubate at 37 °C for 24 hours.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25ºC)
w/o rest	Fine powder	Pink	Red-orange	6,8±0,2

Microbiological test

Incubation conditions: (37 ºC / 24 h)
Inoculation conditions: Confirmation (isolated colony)

Microorganisms	Characteristic reaction
Salmonella enteritidis ATCC 13076	Urease (-): No liberation of ammonia, no change of colour
Salmonella typhimurium ATCC 14028	Urease (-): No liberation of ammonia, no change of colour
Escherichia coli ATCC 25922	Urease (-): No liberation of ammonia, no change of colour
Shigella flexneri ATCC 29903	Urease (-): No liberation of ammonia, no change of colour
Proteus mirabilis ATCC 29906	Urease (+): Liberation of ammonia with colour change to rose/rose-pink/deep cerise

Storage

Temp. Min.:2 ºC
Temp. Max.:8 ºC

Bibliography

Rustigian and Stuart. Proc. Soc. Exp. Biol. and Med. 47:109, 1941. Stuart, Van Stratum and Rustigian. J. Bact. 48:437. 1945. McKay, Edwards and Leonar A. J. Clin. Path. 17:479, 1947. Gordon and Mihn. J. Gen. Microbiol., 21:736. 1959.
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