

Urea Agar Base (i23209)

Used for the differentiation of organisms, especially the *Enterobacteriaceae*, on the basis of urease production.

Industry: Water / Food

Principles & Uses

Urea Agar, as described by Christensen, is employed for detecting urease production in microorganisms, notably *Proteus* and other *Enterobacteriaceae*. The medium includes dextrose, reduced peptone concentration, and a decreased buffering system to enhance sensitivity to urease activity. Peptone supplies essential nutrients, dextrose serves as the energy source, and sodium chloride maintains osmotic equilibrium. Urea hydrolysis releases ammonia, turning the phenol red indicator from orange to pink. Prolonged incubation may induce an alkaline reaction. Negative controls without urea are crucial to avoid false positives. Urea hydrolysis is a common indicator of urease activity, not specific for the rate. Urease breaks urea into carbon dioxide and ammonia, leading to an alkaline shift detected by phenol red. Urea Agar Base, following ISO standards, assists in differentiating urease-producing *Enterobacteria*. Used with TSI Agar, it's a screening medium for *Salmonella* and *Shigella*. This medium is especially valuable for distinguishing *Proteus* from *Salmonella* and *Shigella* in enteric infection diagnosis.

Composition (gr/L)

Peptone 1 g, Dextrose 1 g, Sodium Chloride 5 g, Monopotassium Phosphate 0.8 g, Disodium Phosphate 1.2 g, Phenol Red 0.012 g, Agar 12 g.

Final pH at 25°C 6.8 ± 0.2

Preparation from dehydrated Powder

Suspend 21 g of powder in 950 mL of distilled water. Sterilize in the autoclave at 121°C for 15 minutes. Let it cool to 50 - 55°C. Add 50 mL of Urea Sterile Solution 40% and mix well. Distribute aseptically in tubes and let them solidify in slanted position.

Quality Control

Dehydrated Appearance: Fine, homogeneous, free of extraneous material.

Prepared Appearance: Orange-yellow to pink, clear.

Reaction of 2.1% Solution at 25°C: pH 6.8 ± 0.2

Cultural Response

The medium was inoculated with the organisms listed below. Cultural characteristics observed after an incubation at 35 - 37°C for 18 - 48 hours.

Organism (ATCC*)	Urease Reaction	Color Change
<i>Enterobacter aerogenes</i> (13048)	-	Yellow
<i>Escherichia coli</i> (25922)	-	Yellow
<i>Proteus mirabilis</i> (25933)	+	Pink

*ATCC is a registered trade mark of the American Type Culture Collection.



Escherichia coli (left). *Proteus mirabilis* (middle). Prepared Culture Media (right).

Storage

Keep the container at 15-30 °C. Store prepared medium at 2-8 °C.