

# Urease

**REF** CK4650

## Intended Use

The urease test is used to differentiate urease-positive organisms (eg *Proteus*) from other organisms.

## Background

The urease test is used to determine the ability of an organism to split urea, through the production of the enzyme urease. Two units of ammonia are formed with resulting alkalinity in the presence of the enzyme, and the increased pH is detected by a pH indicator.

*Helicobacter pylori* split urea rapidly, usually within 30 seconds. Its rapidity is a key distinguishing factor for *H. pylori* from other *Helicobacter* species.

*Bacteroides ureolyticus* splits urea rapidly, usually within a few minutes, and this is a quick way of identifying this organism.

The urease test may be used to distinguish *Psychrobacter phenylpyruvicus* from *Moraxella* species and *Corynebacterium diphtheriae* which is urease negative from the urease positive *Corynebacterium ulcerans* and *Corynebacterium pseudotuberculosis*.

Several species of Enterobacterales, including *Klebsiella*, *Proteus* and some *Citrobacter* spp. produce the enzyme urease and this is widely used as a first step in screening non-lactose fermenting colonies from enteric media.

Other species of *Cryptococcus*, *Trichosporon* and *Rhodotorula* can give a positive result for the urease test. Occasionally, *Candida krusei* can give a positive result.

The test involves preparing a heavy suspension of the test organism in the presence of urea, following incubation the development of a pink or reddish colour is a positive reaction.

## Precautions

This product is for in-vitro diagnostic use and should be used by properly trained laboratory professionals. Universal precautions should be taken in the handling, processing and discarding of all materials used to perform the test. Do not use reagents after the expiration date shown on the product label has expired.

## Methods

Use a fresh 18-24 hour culture as older cultures could be less metabolically active and results from these may be unreliable.

### Tube:

Add 3 to 5 drops of sterile distilled water to the urease test tube.

Using a loop, wire or stick take a heavy inoculum (McFarland No. 4) of the test organism and thoroughly mix in the urease test tube.

Incubate at 37°C for 4 hours or 18-24 hours, following incubation observe the colour of the suspension, a pink or reddish colour is a positive result.

## Results

Positive Reaction – pink or reddish colour

Negative Reaction – straw, peach, yellow or colourless.

The rapidity of the change of colour may have a diagnostic interest.

*Morganella morganii*, *Proteus* and *Enterobacter gergoviae* usually show a positive reaction within 4 hours.

*Klebsiella pneumoniae*, *Klebsiella oxytoca* and *Yersinia* spp. will also show a positive reaction but in most cases after overnight incubation.

The remaining Enterobacterales show a negative reaction.

### Limitations

This test should be performed on micro-organisms grown on media appropriate to the specimen.

### Quality Control

A quality control should be undertaken daily or immediately prior to use.

Bacteria

Positive control-

*Proteus vulgaris* ATCC 8427

Negative control-

*Escherichia coli* ATCC 25922

Yeast

Positive control-

*Cryptococcus neoformans* NCPF 3168

Negative control-

*Candida albicans* NCPF 3281

### Shelf Life & Storage

The expiry date, storage temperature (ambient) and storage conditions are indicated on the outer package label.

### Materials provided

Each pack contains 28 capped tubes, each tube includes a tablet containing <2mg of Urea.

### Materials required but not provided

Sterile loops or needles









Sterile distilled water

### References

Standards Unit, National Infection Service, PHE. UK SMI, TP36-Urease Test, Issue 4, 02.04.19.

Barrow, G.I. & Feltham, R.K.A. Cowan and Steel's Manual for the Identification of Medical Bacteria. Third edition.

Ford, M. Medical Microbiology. Oxford University Press.

	Catalogue number
	Batch number
	Use by date
	In-Vitro Diagnostic device
	Contains sufficient for <n> tests
	Temperature storage limitations
	Consult instructions for use
	Manufacturer

Issue	Date	Comments
4	07/09/2020	IFU format revision.

