

# K650/K1650 UREASE TEST

## DISCUSSION:

Several species of Enterobacteriaceae, including *Proteus*, *Klebsiella*, and some *Citrobacter* species, as well as some *Haemophilus* species and several other bacteria, fungi, and yeast species produce the enzyme urease. This enzyme hydrolyzes urea into ammonia, water and carbon dioxide.(1) Since most stool pathogens, particularly *Salmonella*, *Shigella*, and *E. coli*, are urease negative, it can be useful to determine an organism's urease activity. A notable exception to this is *Yersinia enterocolitica*, which is urease positive. Key Urease Test tablets indicate the presence of the alkaline ammonia end product by a color change from straw color to pink or red. Urease Wee-Tabs (K1650) may be used with anaerobes; for best results ensure heavy inoculum is used.

## MATERIAL SAFETY:

Each K650 tablet contains 10 mg. of urea. K1650 tablets contain less than 2 mg. of urea. This product does not contain any material known at this time to be hazardous.

## MATERIALS:

K650 Urease Tablets are sold on bottles of 50 tablets only. K1650 WEE-TABS are sold in packs of 28 ready-to-use, pre-labeled tubes. Urease test tablets require preliminary growth on media appropriate for the specimen. Consult a reference manual such as the Manual of Clinical Microbiology for the appropriate media to use. The following items are required but not provided:

- Test tubes (K650 only)
- Loop for harvesting colonies
- Distilled water, neutral pH

## INSTRUCTIONS:

- 1) Add 1 Urease Test Tablet to 1 ml. of distilled water in a small test tube. For WEE-TAB Urease add 3-5 drops of water.
- 2) Inoculate heavily from a culture grown on a slant or plate. Kligler, Russell, or T.S.I. agar may be used without affecting the results.
- 3) Incubate at 35-37C. *Proteus* spp give a positive test in 1-8 hours. Some *Klebsiella* strains produce urease in smaller amounts and may require up to 24 hours in the K650 to show a positive reaction. Any pink or red color is a positive result. Straw colored, peach, yellow, or colorless are negative results. WEE-TAB reactions take as little as 15 minutes and are finished at 6 hours.

## QUALITY CONTROL:

Key Urease tablets should be tested prior to use with organism of known reactivity. Key suggests *Proteus vulgaris* ATCC 8427 as positive and *E. coli* ATCC 25922 as negative. Discard used tests in a manner conforming with accepted laboratory procedure for bio-hazardous materials.

## REACTIONS:

Organism	Reaction	% Positive
<i>Citrobacter</i> sp.	+	78
<i>Edwardsiella</i>	-	0
<i>Enterobacter</i> sp. *	-	10
<i>E. coli</i>	-	1
<i>Hafnia</i>	-	0
<i>Kleb. pneumoniae</i>	+	96
<i>Morganella</i>	+	98
<i>Proteus mirabilis</i>	+	98
<i>Proteus vulgaris</i>	+	98
<i>Providencia</i> sp.*	+/-	30
<i>Salmonella</i> sp.	-	99
<i>Shigella</i> sp.	-	0
<i>Yersinia</i> sp. *	+	80

\* Reactions vary within species

## REFERENCES:

- (1) Bailey and Scott's Diagnostic Microbiology, 8th Editions, Chapters 9 and 27.



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