K660 & K670 VOGES-PROSKAUER TESTS

PRINCIPLE /DISCUSSION:
Voges-Proskauer tests demonstrate an organism's ability to convert pyruvate to acetoin. This property is a valuable tool in distinguishing *Klebsiella*, *Enterobacter*, *Ewingella* and *Serratia* from other members of Enterobacteraceae, as well as distinguishing between *Proteus vulgaris* (V-P negative) and *P. mirabilis* (V-P positive). Key Scientific has found that modifications in the original procedure can produce more clear cut reactions as well as shorten the incubation period. Key's rapid V-P test can be used in place of any standard V-P test. Since the pyruvate to acetoin conversion occurs more efficiently at a slightly acid pH, the tablets contain dextrose to insure adequate acid formation.

STORAGE:
Store unused tablets, with desiccant, tightly sealed at room temperature.

MATERIALS REQUIRED:
Voges-Proskauer tests require preliminary growth on appropriate media. Consult a manual such as the Manual for Clinical Microbiology for this information.
Each item is sold separately.

- K660 Voges Proskauer Base - 50/bottle
- K670 Voges Proskauer Buffer -50/bottle
- K980670 40% KOH (V-P "B" reagent) -3 mls.
- K980660 alpha-naphthol (V-P "A" reagent) -3 mls

The following items are also required but not provided:

- Test tubes for large tablets
- Loop for colony transfer
- Distilled water

PROCEDURE:
(1) Place 1 of each V-P Tablet and 1 ml. of distilled water into a test tube.
(2) Inoculate heavily with either 2-3 drops of a heavy suspension of the organism to be tested or with a heavy loopful of organism directly from the plate. Best results require a final suspension of at least a #3 McFarland.
(3) Incubate at 35-37^{o}C for 6-8 hours, but no more than 8 hours. Inoculating the V-P tube and refrigerating overnight for incubation the next day will not adversely affect the test.
(4) After incubation, 2 drops of alpha-naphthol reagent and mix by gently shaking.
(5) Next add add 3 drops of 40% KOH. The reagent will form a thin layer on the surface of the liquid. Allow the tube to stand, up to 30 minutes, observing periodically for the appearance of a cherry red color.

INTERPRETATION:
In a positive V-P test, the acetoin will react with alpha-naphthol in the alkaline environment provided by the KOH to produce a cherry red color. The color develops first at the surface and then spreads gradually into the lower part of the tube. In a strong reaction the color appears almost immediately but weaker ones may take 20-30 minutes. No color change, or the appearance of a copper color is a negative result.

QUALITY CONTROL:
KEY Voges-Proskauer Tablets should be tested prior to use with organisms which produce known reactions. Key Scientific suggests *Enterobacter aerogenes* ATCC 13048 for positives and *E. coli* ATCC 25922 for negative. Finished tests should be discarded in a manner appropriate for biohazardous materials.

USUAL REACTIONS:

- *Serratia marcescens* +
- *Serratia liquifaciens* +
- *Klebsiella pneumoniae* +
- *Klebsiella oxytoca* +
- *Enterobacter aerogenes* +
- *Enterobacter cloacae* +
- *Proteus mirabilis* +
- *Proteus vulgaris* -
- *E. coli* -
- *Salmonella* -
- *Shigella* -
- *Citrobacter freundii* -
- *Morganella morganii* -
- *Yersinia enterocolitica* -

REFERENCES:

1) Manual of Clinical Microbiology, Fifth Edition, Chapter 120, "Quality Control" and Chapter 122, "Reagents and Stains"
2) Bailey and Scott's Diagnostic Microbiology, Seventh Edition, Chapter 27, "Enterobacteraceae"

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