Catalase Test

Principle:

The catalase test is used primarily in differentiation between certain genera and species of bacteria.

Catalase is an enzyme present in most cytochrome containing aerobic and facultative anaerobic bacteria. An important exception is *Streptococcus species*.

The test is performed by exposing the test organism to hydrogen peroxide and observing for oxygen production.

Reagents, Supplies, and Equipment:

1. Hydrogen peroxide, 3% ()
   a. Store at 15-30° C
2. Slides
3. Sterile sticks or inoculating loop

Procedure:

1. Using a loop, pick an area of growth from an 18-24 hour old pure colony. Place the growth on a clean microscope slide.
2. Using a Pasteur pipette or a dropper, place a drop of 3% H_2O_2 over the organism on the slide.
3. Observe for immediate bubbling.

Interpretation:

1. Positive reaction - immediate bubbling
2. Negative reaction - no bubbling

Procedural Notes:

Interferences:

1. Because red blood cells contain catalase and will give a false-positive result, the test cannot be performed if blood agar is introduced. Chocolate agar does not interfere.
2. Colonies older than 18-24 hours may lose their catalase activity, and produce a false-negative result.
3. Hydrogen peroxide is unstable and breaks down easily on exposure to light.
4. Care must be exercised in performing the test, since bacteria may be aerosolized as a result of bubbling.

References:

1. Finegold SM, Martin WJ, Scott EG. Reagents and Tests, in Bailey & Scott's Diagnostic Microbiology, 5th ed., CV Mosby Co., St. Louis, MO, p. 482, 1978.
2. McFaddin JF. Biochemical Tests for Identification of Medical Bacteria, 2nd Ed., The Williams and Wilkins Co., 1980.
3. Paik G. Reagents, stains and miscellaneous test procedures, in Lennette E.H (ed.) Manual of Clinical Microbiology, American Society for Microbiology, Washington, DC, 1980.