



Clinical Laboratory Department POLICY AND PROCEDURE

POLICY NUMBER: 1090
VERSION: 3

SUBJECT: Catalase Test

Principle

Catalase is an enzyme that decomposes hydrogen peroxide (H₂O₂) into oxygen and water. Excluding the streptococci, most aerobic and facultatively anaerobic bacteria possess catalase activity. Hydrogen peroxide forms as one of the oxidative end products of aerobic carbohydrate metabolism. If allowed to accumulate, hydrogen peroxide is lethal to bacterial cells. The catalase test is used to differentiate streptococci (negative) from staphylococci (positive).

Materials and Reagents

Hydrogen peroxide, 3%, refrigerated.
Microscope slides
Inoculating needle, bacteriological loop or sterile wooden stick

Specimen

An 18-48 hour agar plate (preferably without blood, since erythrocytes possess catalase activity) containing organism to be tested.

Quality Control

Each bottle of H₂O₂ must be tested with positive and negative control organisms each day of use before unknown bacteria are tested.

Positive control: *Staphylococcus aureus* ATCC #25923 (QC organism #2)
Negative control: *Streptococcus pyogenes* ATCC #19615 (QC organism #3)

Procedure

1. With a loop or sterile wooden stick, transfer a small amount of pure growth from the agar onto the surface of a clean, dry glass slide.
2. Immediately place a drop of 3% hydrogen peroxide onto a portion of a colony on the slide.
3. Observe for an explosive evolution of bubbles of gas, indicating a positive test.

Interpretation

Rapid appearance and sustained production of gas bubbles or effervescence constitutes a positive test. Few tiny bubbles forming after 20 or 30 seconds is not considered a positive reaction. In addition, catalase is present in erythrocytes, and care must be taken to avoid carryover of red blood cells with the colony.

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Reporting

Record results in microbiology workup as positive (+) or (-).

Reference:

Baron, Ellen Jo and Tenover, Sydney M., *Bailey and Scott's Diagnostic Microbiology* 8th edition, St. Louis MO, 1990.

Koneman, E.W., et al. 1988. *Color Atlas and Textbook of Diagnostic Microbiology*, ed. 3. J.B. Lippincott Co., Philadelphia, PA.

Approved By: Brian Yee (PHYS SPEC PATHOLOGY)	
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Written By: Jill Hartenstein (CLINICAL LABORATORY SCIENTIST II)	
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