Technical Data

Catalase Test Kit for Mycobacteria

K044

Intended Use:

Recommended to study catalase activity of Mycobacteria.

Kit contains

SL122-HiCatalase™ glass tubes w/ 5ml of L.J. medium	
R057- Catalase buffer 0.5ml (for heat stable catalase study)	
R058,Catalase Reagent	5 nos.
Part A : H_2O_2 (30%) &	5 nos.
Part B : Tween 80 (10%)	
	5ml
	5ml

Catalase test kit is an easy test kit used to study catalase activity of *Mycobacteria* which requires simple addition of the catalase reagent and visual interpretation. Most *Mycobacteria* produce the enzyme catalase, but they vary in the quantity produced. Heat stable catalase can be detected by inactivating at 68°C for 20 minutes. The semiquantitation of catalase and susceptibility to heating at 68°C, at pH 7.0 are both useful characteristics in identifying *Mycobacteria.*

Principle :

Organisms producing the enzyme catalase have the ability to decompose hydrogen peroxide into water and free oxygen.

$2H_2O_2 \longrightarrow 2H_2O + O_2$

The test for mycobacterial catalase differs from that used to detect catalase in other types of bacteria by using 30% hydrogen peroxide in a strong detergent solution (10% Tween 80) instead of the usual 3% hydrogen peroxide solution. The detergent helps to disperse the hydrophobic tightly clumped Mycobacteria from large aggregates to individual bacilli maximizing the detection of catalase.

Kit contents :

Directions :

Reagent preparation :

Mix equal volume of R058, Part A and Part B just before use. Shake gently.

I. Semiquantitative Test

1. Inoculate the surface of SL122, Hicatalase glass tube w/5ml of L.J. Medium with 0.1ml of 7 day liquid culture of the test organism.
2. Incubate at 37°C for two weeks.
3. Note that the caps of the tubes should be slight loose to permit adequate exchange of air.
4. Add one ml of freshly prepared R058, catalase reagent, and leave upright for 5 minutes.
5. Measure the height of column of bubbles/ effervescence above the surface of culture medium and record.

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II. Heat stable catalase

The determination of heat stable catalase is a very helpful characteristic in identifying the nonpigmented mycobacteria. Heat labile catalase is a characteristic of *M.tuberculosis., M.bovis, M.gastri* and occasional strains of the *M. avium* complex.

1. Emulsify several colonies of test organism in 0.5ml of R057, Catalase buffer provided. Screw the tube.
2. Place the tubes in a waterbath at 68° C for 20 mins.
4. Remove the tube and allow it to cool at room temperature.
5. Add 0.5 ml of freshly prepared catalase reagent, R058.
6. Watch for bubbles on the surface of the fluid.
7. Do not discard as negative until 20 minutes.

Interpretation

In each of the tests, presence of catalase is indicated by bubbles. Do not shake the tube because a false impression of bubbles can develop from presence of detergent in mixture.

I. Semiquantitative

1. A column of bubbles 5 to 50 mm : weakly positive
2. A column of bubbles greater than 50 mm : strongly positive
3. Lack of bubbles : Negative.

II. Heat stable catalase

Development of bubbles : Positive reaction
No Bubbles : Negative reaction

References :

1. Kubica,CP etal. Differential identification of Mycobacteria: I. tests on catalase activity. Am. Rev. Respir Dis, 95:400-405, 1966.
2. Koneman, W.E et. al. 1992. Color Atlas and Textbook of Diagnostic Microbiology, 4th ed. J.B. Lippincott company, Philadelphia.
3. Isenberg, H.D. 2004. Clinical Microbiology Procedures Hand book, 2nd edn., ASM Press.