ALPHA DIAGNOSTIC INTERNATIONAL

Product Data Sheet

Catalase

Cat#	CAT-01	Catalase (~10,000-15000 u/mg), bovine liver	**Size:** 500 mg
Cat#	CAT-02	Catalase (2000-4000 u/mg), Aspergillus Niger)	**Size:** 500 mg
Cat#	CAT-03	Catalase 4000-6000 U/mg), Bovine Liver	**Size:** 500 mg

Form: powder **Storage**: dessicate at -20oC

Catalase is a common enzyme found in nearly all living organisms that are exposed to oxygen, where it functions to catalyze the decomposition of hydrogen peroxide to water and oxygen. Catalase has one of the highest turnover numbers of all enzymes; one molecule of catalase can convert 40 million molecules of hydrogen peroxide to water and oxygen each second.

Catalase is a tetramer of four polypeptide chains, each over 500 amino acids long. It contains four porphyrin heme (iron) groups that allow the enzyme to react with the hydrogen peroxide. The optimum pH for human catalase is approximately 7, and has a fairly broad maximum (the rate of reaction does not change appreciably at pHs between 6.8 and 7.5). The pH optimum for other catalases varies between 4 and 11 depending on the species.[6] The optimum temperature also varies by species

Catalase is a heme-containing enzyme which catalyzes the following reaction:

$$2H_2O_2 \xrightarrow{\text{CATALASE}} 2H_2O + O_2$$

Catalase is present in a wide variety of tissues from animals, plants and microorganisms. Mammalian liver contains high concentrations of the enzyme. Bovine liver catalase has a molecular weight of 250,000 with four subunits of equal size. Optimum pH is 7.0 and isoelectric point is 5.4.

Encapsulated or immobilized catalase is used in the food industry whenever hydrogen peroxide needs to be destroyed, for example, in the manufacture of cheese (Chu, H.D., Leeder, J.G. and S.C. Gilbert, J. Food Sci, 40, 641, 1975). Catalase can also be used in coupled systems for the determination of metabolites in biological fluids.

Catalase is isolated and purified from Aspergillus Niger or bovine liver.

Form and Storage

Catalase is isolated from Aspergillus Niger or bovine liver. Protein content is 90-95%. Enzyme activity of the lot is specified on the vial. The powdered enzyme should be stored in the freezer (–20℃). If properly stored, these products have a shelf life of at least two years..

Solubility: Soluble in distilled water or dilute buffer

Unit Definition

The amount of enzyme which catalyzes the decomposition of one micromole of H_2O_2 per minute at 25℃ and pH 7.00.

Assay Methods

The decomposition of hydrogen peroxide, which is a measure of catalase activity, can be followed by measuring the absorbance at 240 nm (Methods of Enzymatic Analysis, Bergmeyer, H.U., ed., Vol 1, p 438, 1974, Academic Press, New York).

Reagents

1. 0.05 M Potassium phosphate buffer, pH 7.0.
2. 0.05% Hydrogen Peroxide (substrate) solution. Dilute 0.2 ml of 30% H_2O_2 to 100 ml with phosphate buffer. The absorbance at 240 nm should be in the range of 0.50-0.55.
3. Catalase (enzyme) solution. Dilute in buffer to yield a concentration of 5-10 U/ml. Prepare fresh prior to assay.

Procedure

1. Set spectrophotometer (equipped with a strip chart recorder and temperature control) at 240 nm and 25℃.
2. In a quartz cuvette pipette 2.9 ml of diluted H_2O_2 solution (substrate). Incubate in spectrophotometer at 25℃ for 5 min. to attain temperature equilibration. Record absorbance at 240 nm (blank).
3. Initiate reaction by adding 0.1 ml diluted enzyme (catalase) solution to the cuvette. Record decrease in absorbance at 240 nm for 2-3 minutes.
4. Calculate E240 nm/min

References

Cheilkani P (2004) Cell. Mol. Life Sci. 61 (2): 192–208; maehly A (1954) Methods Biochem Anal 1: 357–424; Summer JB (1937) Science (journal) 85 (2206): 366–367

For in vitro research use only

Related Material available for ADI

CAT-01-03 **101201A**

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