

Product Information

sigma-aldrich.com

3050 Spruce Street, Saint Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Acid Phosphatase, Prostatic from bovine semen

Catalog Number **P3147**

Storage Temperature $-20\text{ }^{\circ}\text{C}$

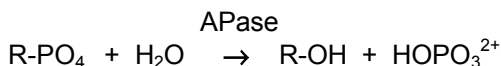
CAS RN 9001-77-8

EC 3.1.3.2

Synonyms: prostatic acid phosphatase (PAP);
Orthophosphoric-monoester phosphohydrolase (acid
optimum)

Product Description

Acid phosphatases (APase) are a family of enzymes that non-specifically catalyze the hydrolysis of monoesters and anhydrides of phosphoric acid to produce inorganic phosphate at an optimum pH of 4 to 7 by the following reaction:



Their function in the production, transport, and recycling of phosphate is critical for the metabolic and energy transduction processes of the cell. As a group APases may be as important as kinases in regulatory processes.¹

Acid phosphatase is a monomeric glycoprotein containing galactose, mannose, and glucosamine.²

Molecular mass:² 41.5 kDa

pH optimum:³ 5.5

pH range:⁴ 4.0–6.0

Optimum temperature:⁵ $37\text{ }^{\circ}\text{C}$

Activators:^{3,5}

Fe^{2+} , Mg^{2+} , Mn^{2+} , Zn^{2+} (below 1 mM)

Inhibitors:

Hg^{2+} ,⁷ MoO_4^{2-} ,⁶ Zn^{2+} ,³
PCMB,³ NEM,⁷ F^-

p-nitrophenyl sulfate⁶
tartrate (inhibits 95% of acid phosphatase activity)

Substrates:

α -glycerophosphate⁷ 2-glycerophosphate⁷
fructose-6-phosphate⁶ galactose-6-phosphate⁷
glucose-1-phosphate⁶ glucose-6-phosphate⁶
p-nitrophenyl phosphate³ AMP,⁶ ATP,³ GTP,³ UMP⁶

K_M (mM):

1.71, *p*-nitrophenyl phosphate⁵
0.45, DL-phosphotyrosine,³ pH 8
1.0, α -glycerophosphate⁶

This product (Catalog Number P3147) is partially purified from bovine semen and is supplied as a lyophilized powder.

Specific activity: ~ 2 units/g solid

Unit definition: One unit will hydrolyze 1.0 μmole of *p*-nitrophenyl phosphate per minute at pH 4.8 at $37\text{ }^{\circ}\text{C}$. Prostatic acid phosphatase activity is the difference between the total acid phosphatase activity and the acid phosphatase activity in the presence of 20 mM tartrate.

APase is assayed spectrophotometrically in a 1.2 ml reaction mixture containing 38 mM citrate buffer at pH 4.8 and $37\text{ }^{\circ}\text{C}$, 4.7 mM *p*-nitrophenyl phosphate, and 0.004 unit APase. To assay for tartrate-resistant APase, tartrate is added to a final concentration of 20 mM.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

APase is soluble in cold water (0.015–0.025 unit/ml). Prepare solution immediately before use.

Storage/Stability

Store the product at $-20\text{ }^{\circ}\text{C}$. When stored at $-20\text{ }^{\circ}\text{C}$, the enzyme retains activity for at least one year.

References

1. Vincent, J.B., *et al.*, Hydrolysis of phosphate monoesters: a biological problem with multiple chemical solutions. *Trends Biochem. Sci.*, **17**, 105-10 (1992).
2. Andrews, A.T., Bovine milk acid phosphatase. III. Purification and characterization of the enzyme. *Biochim. Biophys. Acta*, **434**, 345-53 (1976).
3. Lau, K.H.W., *et al.*, Bone acid phosphatase is a neutral pH phosphoryl protein phosphatase. *Adv. Protein Phosphatases*, **4**, 165-98 (1987).
4. Andrews, A.T., and Pallavicini, C., Bovine milk acid phosphatase. I. Some kinetic studies and other properties using a partially purified preparation. *Biochim. Biophys. Acta*, **321**, 197-209 (1973).
5. Prus, K., and Wallin, M., Characterization of acid and alkaline phosphatase activity in preparations of tubulin and microtubule-associated proteins. *FEBS Lett.*, **151**, 54-8 (1983).
6. Chaimovich, H., and Nome, F., Purification and properties of an acid phosphatase from bovine brain. *Arch. Biochem. Biophys.*, **139**, 9-16 (1970).
7. Hollander, V.P., Acid phosphatases. In *The Enzymes*, Vol. 4, 3rd ed., Boyer, P.D., ed., Academic Press, (New York, NY; 1971) pp. 449-98.

KAD,RBG,JWM,MAM 11/07-1

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.