Product Information

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Acid Phosphatase, Prostatic
from bovine semen

Catalog Number **P3147**
Storage Temperature –20 °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:

$$R\text{-}PO_4 + H_2O \xrightarrow{\text{APase}} R\text{-}OH + HOPO_3^{2+}$$

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 °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 sulfate[6]
tartrate (inhibits 95% of acid phosphatase activity)

Substrates:
α-glycerophosphate[7] 2-glyceryophosphate[7]
fructose-6-phosphate[6] galactose-6-phosphate[7]
glucose-1-phosphate[6] glucose-6-phosphate[6]
p-nitrophenyl phosphate[3] AMP,[6] ATP,[3] GTP,[3] UMP[6]

K_M (mM):
1.71, p-nitrophenyl phosphate[5]
0.45, DL-phosphotyrosine,[3] pH 8
1.0, α-glycerophosphate[6]

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 °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 °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 °C. When stored at –20 °C, the enzyme retains activity for at least one year.

References

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6. Chaimovich, H., and Nome, F., Purification and properties of an acid phosphatase from bovine brain. Arch. Biochem. Biophys., **139**, 9-16 (1970).
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