

# Product Information

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## Acid Phosphatase from potato

Catalog Number **P1146**

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

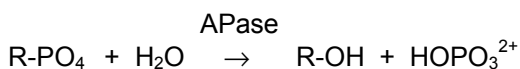
CAS RN 9001-77-8

EC 3.1.3.2

Synonyms: Apase; 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.<sup>1</sup>

Plant APases have been localized in the cytosol, vacuoles, and cell walls. One key role is phosphate acquisition to mobilize organic phosphates in the soil.<sup>2</sup> Phosphate starvation also induces APase generation.

Potato tuber APase is a monomeric glycoprotein. The carbohydrate component makes up 16.6% of the molecular mass.<sup>3</sup>

Molecular mass:<sup>3</sup> 69 kDa

Carbohydrate residues (%):<sup>3</sup>

Mannose	5.0
Glucosamine	3.6
Rhamnose	3.4
Glucose	2.5
Galactose	1.5

pH Optimum:<sup>3</sup> 5.0–5.3

pH Range:<sup>4</sup> 4–7

Temperature optimum: 37 °C

Substrates:<sup>3,5</sup>

$\alpha$ -glyceryophosphate	ATP
fructose-6-phosphate	fructose-6-phosphate
inorganic pyrophosphate	glucose-6-phosphate
<i>p</i> -nitrophenyl phosphate	

$K_M$  (mM):<sup>3</sup>

<i>p</i> -nitrophenyl phosphate	1.25
inorganic pyrophosphate	40.0

Activators:<sup>6</sup>

$\text{Cu}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Hg}^{2+}$  (below 0.4 mM)

Inhibitors:<sup>3,6</sup>

$\text{Al}^{3+}$ ,  $\text{Hg}^{2+}$  (above 0.4 mM),  $\text{MoO}_4^{2-}$ ,  $\text{Zn}^{2+}$ , urea

This product is partially purified from potato tubers and is supplied as a gray-tan lyophilized powder.

Specific activity: 3–10 units/mg solid

Unit definition: One unit will hydrolyze 1.0  $\mu\text{mole}$  of *p*-nitrophenyl phosphate per minute at pH 4.8 at 37 °C.

APase is assayed spectrophotometrically in a 1.1 ml reaction mixture containing 41 mM citrate buffer, pH 4.8 at 37 °C, 6.9 mM *p*-nitrophenyl phosphate, and 0.015–0.025 unit APase.

### 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 (0.15–0.25 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.

APase can lose half its activity after 30 minutes at 60 °C and 100% of its activity after two hours at 70 °C.<sup>3</sup>

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## References

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2. Olczak, M., *et al.*, Plant purple acid phosphatases – genes, structures, and biological function. *Acta Biochim. Pol.*, **50**, 1245-56 (2003).
3. Kruzel, M., and Morawiecka, B., Acid phosphatase of potato tubers (*Solanum tuberosum* L.). Purification, properties, sugar, and amino acid composition. *Acta Biochim. Pol.*, **29**, 321-30 (1982).
4. Waymack, P.P., and van Etten, R.L., Isolation and characterization of a homogeneous isoenzyme of wheat germ acid phosphatase. *Arch. Biochem. Biophys.*, **288**, 621-33 (1991).
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KAD,RGB,JWM,MAM 12/07-1

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