

## Product Information

# Phosphatase, Acid from potato

Lyophilized powder,  $\geq 0.5$  units/mg solid**P3752**

## Product Description

CAS Number: 9001-77-8

Enzyme Commission (EC) Number: 3.1.3.2

Synonyms: Acid phosphatase, APase, Orthophosphoric-monoester phosphohydrolase (acid optimum)

Molecular mass:<sup>3</sup> ~69 kDaCarbohydrate residues (%):<sup>3</sup>

- Mannose: 5.0
- Glucosamine: 3.6
- Rhamnose: 3.4
- Glucose: 2.5
- Galactose: 1.5

pH Optimum:<sup>3</sup> 5.0–5.3pH Range:<sup>4</sup> 4–7

Temperature optimum: 37 °C

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

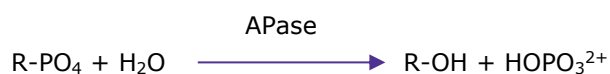
- $\alpha$ -glycerylphosphate
- ATP
- Fructose-6-phosphate
- Inorganic pyrophosphate
- Glucose-6-phosphate
- *p*-nitrophenyl phosphate

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

- *p*-nitrophenyl phosphate: 1.25
- Inorganic pyrophosphate: 40.0

Activators:<sup>6</sup>  $\text{Cu}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Hg}^{2+}$  (< 0.4 mM)Inhibitors:<sup>3,6</sup>  $\text{Al}^{3+}$ ,  $\text{Hg}^{2+}$  (> 0.4 mM),  $\text{MoO}_4^{2-}$ ,  $\text{Zn}^{2+}$ , urea

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 general 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> Several publications<sup>7-13</sup> have cited use of product P3752 in their research protocols.

## Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

## Reagent

Specific activity: 0.5-3.0 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.

## Preparation Instructions

APase is soluble in cold water (0.15-0.25 unit/mL). Prepare solutions immediately before use.

One publication cites preparation of stock solutions of this APase product in 0.1 M acetate buffer (pH 5.6), at 6.25 mg of this product per 1 mL of buffer.<sup>14</sup> Alternatively, another publication has prepared 6.25 mg/mL stock solutions of this same enzyme in 0.4 M acetate buffer (pH 5.6).<sup>15</sup>

## Storage/Stability

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

In solution, 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>

## References

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P3752dat Rev 10/22 KAD,RBG,JWM,GCY,MAM

