Inorganic pyrophosphatase

Cat.No.:HYJ221

Product Description

Inorganic pyrophosphatase (yeast) is derived from a recombinant Escherichia coli strain carrying the Saccharomyces cerevisiae inorganic pyrophosphatase gene. This enzyme catalyzes the hydrolysis of inorganic pyrophosphate to produce orthophosphate:

$P_2O_7^{-4} + H_2O \rightarrow 2HPO_4^{-2}$

In reactions such as nucleic acid amplification and in vitro transcription, inorganic pyrophosphatase hydrolyzes the inorganic pyrophosphate generated during these reactions, thereby relieving the inhibitory effect of the generated inorganic pyrophosphate on the reaction system. The removal of pyrophosphate shifts the reaction equilibrium toward product formation, thereby increasing the yield of the synthesized product. For example, in RNA and DNA synthesis reactions, the action of inorganic pyrophosphatase shifts the reaction equilibrium toward product formation.

Components

Components	10U	50U	100U	1KU	10KU
Inorganic pyrophosphatase (yeast) 0.1U/μL	0.1 mL	0.5 mL	1 mL	10 mL	100 mL

Storage

Store at -25 to -15°C. Valid for 2 years (avoid repeated freezing and thawing).

Storage buffer

20 mM Tris-HCl (pH 8.0), 100 mM KCl, 0.1 mM EDTA, 1 mM dithiothreitol, 50%glycerol.

Activity Definition

One activity unit (U) is defined as the amount of enzyme required to catalyze the hydrolysis of inorganic pyrophosphate to produce 1 μmol of phosphate per minute under standard reaction conditions.

Standard reaction conditions are: a 500 μL reaction system containing 100 mM Tris-HCl (pH 7.2, 25°C), 2 mM $MgCl_2$, and 2 mM inorganic pyrophosphate, at 25°C for 10 min.

Quality Control

1. **Exonuclease activity:** When 0.1 U of this product was reacted with 1 μg of λ-Hind III digested DNA at 37°C for 16 hours, the electrophoretic band of the DNA remained unchanged.
2. **Endonuclease activity:** When 0.1 U of this product was reacted with 1 μg of λ DNA at 37°C for 16 hours, the electrophoretic band of the DNA remained unchanged.
3. **Nickase activity:** When 0.1 U of this product was reacted with 1 μg of pBR322 at 37°C for 16 hours, the electrophoretic band of the DNA remained unchanged.
4. **RNase activity:** When 0.1 U of this product was reacted with 1.6 μg of MS2 RNA at 37°C for 4 hours, the electrophoretic band of the RNA remained unchanged.
5. **Residual E. coli DNA detection:** Residual nucleic acid in 0.1 U of this product was detected by qPCR using an E. coli 16s rDNA-specific TaqMan PCR kit. Detection: E. coli genome residue ≤ 1 copy.
6. **Endotoxin:** LAL-Test, Chinese Pharmacopoeia 2020 Edition, Part IV, Gel Limit Test, General Rules(1143), bacterial endotoxin content ≤ 10 EU/mg.

Applications

Increase RNA yield in transcription reactions.

Notes

1. This product is active in a variety of reaction buffers and can generally be added directly in experiments such as HDA amplification and LAMP amplification.
2. The dosage of this product requires optimization for each experiment, typically ranging from 0.05 to 1 U/mL. 4 U/mL is recommended for in vitro transcription systems.
3. This product is active at temperatures between 16°C and 37°C, but the optimal reaction temperature is 25°C.
4. For your safety and well-being, please wear a lab coat and disposable gloves during operation.