

Product Information

Polynucleotide Kinase from T4-infected *Escherichia coli*

Catalog Number **P4390**
Storage Temperature -20°C

CAS RN 37211-65-7
EC 2.7.1.78

Product Description

Polynucleotide Kinase catalyzes a "forward reaction" transfer of the γ -phosphate of ATP to the 5'-hydroxyl terminus of single and double-stranded nucleic acids (DNA and RNA) and 3'-nucleoside monophosphates. In exchange reactions containing ADP, the enzyme will catalyze the exchange between 5'-terminal phosphate groups and ATP. 3'-phosphatase activity enables the enzyme to remove 3'-phosphoryl groups from phosphorylpolynucleotides.¹⁻³

Forward Reaction

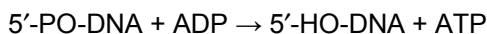
Transfer of labeled γ -phosphate from $[\gamma\text{-}^{32}\text{P}]\text{-ATP}$ to the free 5'-hydroxyl group of the substrate.



Substrates that do not have a free 5'-hydroxyl group require prior dephosphorylation by alkaline phosphatase.

Exchange reaction

First, the terminal 5'-phosphate group is transferred from the substrate to ADP present in the reaction mixture. Then, the labeled γ -phosphate from $[\gamma\text{-}^{32}\text{P}]\text{-ATP}$ is transferred to the free hydroxyl group of the substrate.



Applications for Polynucleotide Kinase include:

- Sequencing or nucleic acid tagging (DNA and RNA) by 5'-end labeling
- 5' phosphorylation of oligonucleotides
- Removal of 3'-phosphate groups from phosphorylpolynucleotides

The product is supplied in a solution of 50% (v/v) glycerol, 20 mM Tris-HCl, pH 7.5, with 25 mM KCl, 2 mM DTT, 0.1 mM EDTA, and 0.1 μM ATP.

Activity: ~ 10 units/ μL

Unit Definition: One unit catalyzes the transfer of one nanomole of ^{32}P to the 5'-end of micrococcal nuclease-treated DNA in 30 minutes at 37°C . Transfer is detected as incorporation into acid-insoluble material. Activity is determined in a reaction mixture containing 40 mM Tris-HCl, pH 7.5, with 10 mM MgCl_2 , 5 mM dithiothreitol, 0.5 mM 5'-OH polynucleotide ends, and 0.1 mM $[\gamma\text{-}^{32}\text{P}]\text{-ATP}$.

No endonuclease or exonuclease activity detected.

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.

Storage/Stability

The product ships on wet ice and storage at -20°C is recommended. Do not store in a frost-free freezer. The frequent freeze-thaw cycles may decrease enzyme stability.

Centrifuge to improve recovery of product from its storage container.

References

1. Berkner, K.L., and Folk, W.R., J. Biol. Chem., **252**, 3176 (1977).
2. Sirotkin, K., *et al.*, J. Mol. Biol., **123**, 221-233 (1978).
3. Cameron, V., and Uhlenbeck, O.C., Biochemistry, **16**, 5120-5126 (1977).

NC,KH,JB,MAM, NRC 11/08-1

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