Product Information

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Triosephosphate Isomerase, type I from baker's yeast (*S. cerevisiae*)

Catalog Number **T2507**
Storage Temperature 2–8 °C

CAS RN 9023-78-3
EC 5.3.1.1
Synonyms: TPI; D-Glyceraldehyde-3-phosphate ketolisomerase

Product Description
Triosephosphate Isomerase (TPI) catalyzes the interconversion of D-glyceraldehyde 3-phosphate (GAP) and dihydroxyacetone phosphate (DHAP). TPI plays a role in the glycolytic pathway and in gluconeogenesis. While the reaction is reversible, the formation of dihydroxyacetone phosphate is favored by a ratio of 20:1 over the reverse reaction.[1]

A deficiency in TPI is an autosomal recessive disorder in children under five characterized by cardiomyopathy, congenital hemolytic anemia, and susceptibility to bacterial infection. Most children with this disorder do not survive beyond age five.[1]

Molecular mass: 53 kDa (equilibrium centrifugation)
TPI exists as a dimer, consisting of two, low-stability monomers. Amino acid residues associated with substrate binding and catalysis are located on the same subunit, but only the dimer is enzymatically active.[2,3]

Isoelectric Point (pI):[4] 9.85

pH Optimum:[3] 7.0

pH Range:[3] 7.0–8.5

Temperature optimum:[5] 30 °C

K_M:[3] 1.27 mM (D-Glyceraldehyde 3-phosphate)
1.23 mM (Glycerone phosphate)

Inhibitors:[3,5]

acetylphosphate	AsO_2
2,4-dinitrofluorobenzene	PCMB
1-chloro-3-hydroxyacetone	iodoacetate
D-α-glycerophosphate	phosphate
phosphoenolpyruvate	phosphoglycolate
phosphoglycolohydroxamate	

This product is purified from baker's yeast and is supplied as a crystalline suspension in 2.7 M $(NH_4)_2SO_4$, pH 6.5, containing 0.5 mM EDTA.

Specific Activity: ~10,000 units/mg protein

Unit Definition: One unit will convert 1.0 μmole of D-glyceraldehyde-3-phosphate to dihydroxyacetone phosphate per minute at pH 7.6 at 25 °C.

TPI is assayed spectrophotometrically in a 3.0 ml reaction mixture containing 0.5 mM Tris, pH 7.6, 280 mM triethanolamine, 0.132 mM β-NADH, 4.9 mM DL-glyceraldehyde 3-phosphate, 4 units of α-glycerophosphate dehydrogenase, and 0.02–0.04 unit of triosephosphate isomerase.

This product contains no detectable activity for the following enzymes (detection limit: 0.01% of TPI activity):
aldolase
glyceraldehyde-3-phosphate dehydrogenase
lactic dehydrogenase
α-glycerophosphate dehydrogenase
phosphoglucose isomerase
3-phosphoglyceric phosphokinase
pyruvate kinase

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
Dilute the product in 15 mM Tris buffer, pH 7.6, containing 0.02% (w/v) BSA. When performing enzymatic assays, dilute below 1 unit/ml immediately before use.

Storage/Stability
Store product at 2–8 °C. When stored at –20 °C, the enzyme retains activity for at least two years.

This enzyme may be stable for up to 15 minutes when diluted 10-fold in cold 15 mM Tris, pH 7.2, containing 0.02% BSA and kept on ice.

References

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KAD,RBG,MAM,JWM 11/07-1