

**β-NICOTINAMIDE ADENINE DINUCLEOTIDE  
PHOSPHATE  
REDUCED FORM TETRATRIS SALT  
Sigma Prod. No. N6256**

**CAS NUMBER:** 100929-75-7

**SYNONYMS:** NADPH, β-NADPH, TPNH

(Also available as potassium, cyclohexylammonium, and sodium salts)

**ANALOGS:** 3'-β-NADPH, α-NADPH, DeaminoNADPH, ThioNADPH

**PHYSICAL PROPERTIES:**

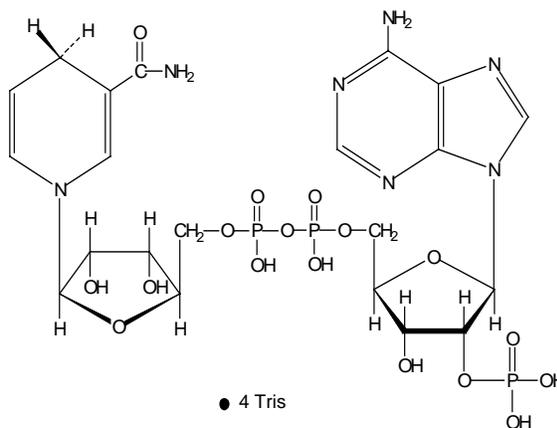
Appearance: white to light yellow powder

Molecular Formula: C<sub>21</sub>H<sub>30</sub>N<sub>7</sub>O<sub>17</sub>P<sub>3</sub>A(C<sub>4</sub>H<sub>11</sub>NO<sub>3</sub>)<sub>4</sub>

Formula Weight: 1230.0

E<sup>mm</sup>(340nm) = 6.22 (pH >10)

(A<sub>260nm</sub>/A<sub>340nm</sub>) = 2.32



**DESCRIPTION:**

β-Nicotinamide Adenine Dinucleotide Phosphate, Reduced Form, is prepared by the chemical reduction of β-Nicotinamide Adenine Dinucleotide Phosphate. The tris form is prepared for work requiring sodium free systems.

**STABILITY / STORAGE AS SUPPLIED:**

The recommended storage condition for β-NADPH is dark and desiccated at -20°C. The expected shelf-life is approximately two years. The normal impurities and/or decomposition products are β-NADP and Monophospho-Adenosine 5'-Diphosphoribose.

**SOLUTION / SOLUTION STABILITY:**

Sigma routinely tests the solubility of this product at 50 mg/mL in 0.01M sodium hydroxide. A clear, light yellow solution is obtained. A 0.5mM solution in 0.02M NaOH (pH 12.3) showed no loss of purity in a week at 4°C or -85°C, but a 13% loss at -20°C.<sup>1</sup>

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**APPLICATIONS:**

β-NADPH is a product of the pentose phosphate pathway, a multifunctional pathway whose primary purpose is to generate reducing power in the form of β-NADPH.<sup>2</sup> β-NADPH transfers H<sup>+</sup> and 2e<sup>-</sup> to oxidized precursors in the reduction reactions of biosynthesis. Thus, β-NADPH cycles between catabolic and biosynthetic reactions and serves as the carrier of reducing power in the same way that ATP serves as the carrier of energy.<sup>3</sup> β-NADPH is also involved with Cytochrome P450 electron transport systems.<sup>2</sup>

Enzymes employing β-NADPH as a coenzyme include glutathione reductase, diacetyl reductase, dihydrofolate reductase, glutamic dehydrogenase, p-hydroxybenzoate hydroxylase, NADPH-FMN oxidoreductase, nitrate reductase and thioredoxin reductase.

**REFERENCES:**

1. Passonneau, J.V. and O.H. Lowry, *Enzymatic Analysis A Practical Guide*, p. 15.
2. *Textbook of Biochemistry With Clinical Correlations*, Thomas M Devlin, Editor, Wiley-Liss, p. 360-365 and p. 987.
3. *Biochemistry A Problems Approach*, William B. Wood, et.al., Editors, W.A. Benjamin, Inc., p. 195.