Catalog Number: 101167, 151742

beta-Nicotinamide Adenine Dinucleotide Phosphate Reduced Tetrasodium Salt

Structure:

Molecular Formula: $C_{21}H_{26}N_7O_{17}P_3Na_4$

Molecular Weight: 833.4

CAS # : 2646-71-1

Synonyms: b-NADPH; TPNH; Coenzyme II reduced form tetrasodium salt; Dihydronicotinamide-adenine dinucleotide phosphate tetrasodium salt; Triphosphopyridine nucleotide reduced tetrasodium salt

Physical Description: White to off-white powder

Solubility: Soluble in water (50 mg/ml - clear, colorless to slightly yellow solution). A 0.5 mM solution in 0.02 M 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.[10]

Description: b-NADPH is a product of the pentose phosphate pathway, a multifunctional pathway whose primary purpose is to generate reducing power in the form of b-NADPH.[1] b-NADPH transfers H^+ and 2 e^- to oxidized precursors in the reduction reactions of biosynthesis. Thus, b-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.[16] b-NADPH is also involved with Cytochrome P450 electron transport systems.[1]

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

Typical Assay Procedure:

Method: Enzymatic determination

The decrease in absorbance is measured at 340 nm, Hg 334 nm or Hg 365 nm.

Reagents:

1. Triethanolamine buffer (0.1 mol/L; pH 7.6): 1.86 g TEA-HCl/80 ml distilled water; adjust to pH 7.6 with NaOH, 1 mol/L; adjust volume to 100 ml.
2. Ammonium chloride (3 mol/L): 16.5 g NH_4Cl in distilled water; adjust volume to 100 ml.
3. a-Oxoglutarate (0.2 mol/L): 45 mg a-oxoglutarate disodium salt dihydrate/1 ml distilled water.
4. Glutamate dehydrogenase, from beef liver: 20 mg protein/ml; ~120 units/mg.

Sample:

Dissolve 25 mg NADPH in 25 ml distilled water (volumetric flask).

Procedure:

Wavelength:	340 nm; e_{340} = 6.3	[$mmol^{-1} \times cm^{-1}$]	
	334 nm; e_{334} = 6.18	[$mmol^{-1} \times cm^{-1}$]	
	365 nm; e_{365} = 3.4	[$mmol^{-1} \times cm^{-1}$]	
Light Path:	1 cm	Total Volume:	2.86 ml
Temperature:	20 - 25°C	Sample Volume:	0.10 ml

Pipette into cuvette:

Reagent	*#*	*Amount*	
buffer	(1)	2.50 ml	
NH_4Cl	(2)	0.15 ml	
a-oxoglutarate	(3)	0.10 ml	mix, read the absorbance A_1, add
sample		0.10 ml	mix, read the absorbance A_2. Start the reaction by addition of
GIDH	(4)	0.01 ml	mix, read the absorbance A_3, add
GIDH	(4)	0.01 ml	mix, read the absorbance A_4 (absorbance due to the enzyme)

Calculation:

Availability:

Catalog Number	Description	Size
101167	b-NADPH, tetrasodium salt, purity approximately 98%	25 mg 50 mg 100 mg 250 mg 500 mg 1 g
151742	b-NADPH, tetrasodium salt, purity approximately 95-97%	25 mg 50 mg 100 mg 250 mg 500 mg 1 g

References:

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