Catalog Number: 101166, 194715, 194777

beta-Nicotinamide Adenine Dinucleotide Phosphate, Disodium Salt and Monopotassium Salt

Structure:

Disodium Salt:
Molecular Formula: $C_{21}H_{26}N_7O_{17}P_3Na_2$

Molecular Weight: 787.4

CAS # 24292-60-2

Monopotassium Salt:
Molecular Formula: $C_{21}H_{27}N_7O_{17}P_3K$

Molecular Weight: 781.5

CAS # 68141-45-7

Synonyms: b-NADP; TPN; Triphosphopyridine nucleotide; NADP; Coenzyme II

Physical Description: White to off-white powder

E^{mM} (260 nm): 18.0 (0.1 M phosphate, pH 7.0)[3]

Solubility: Soluble in water (50 mg/ml - clear, colorless to slight yellowish solution) or methanol; less soluble in ethanol; practically insoluble in ether and ethyl acetate.[1] Solutions should be aliquoted and stored at -20°C for up to approximately 6 months.

Description: b-NADP is a coenzyme necessary for the alcoholic fermentation of glucose and the oxidative dehydrogenation of other substances. It occurs widely in living tissue, especially in the liver.

Nicotinic acid can be converted to nicotinamide in the body and, in this form, is found as a component of two oxidation-reduction coenzymes: nicotinamide adenine dinucleotide (NAD) and nicotinamide adenine dinucleotide phosphate (NADP). The nicotinamide portion of the coenzyme transfers hydrogens by alternating between oxidized quaternary nitrogen and a reduced tertiary nitrogen.

NADP is an essential coenzyme for glucose-6-phosphate dehydrogenase which catalyzes the oxidation of glucose-6-phosphate to 6-phosphogluconic acid. This reaction initiates metabolism of glucose by a pathway other than the citric acid cycle. This route is known as the hexose phosphate shunt or phosphogluconate pathway.[4]

Other enzymes which utilize NADP as a coenzyme are: Alcohol dehydrogenase:NADP dependent; Aromatic

ADH:NADP dependent; Ferredoxin-NADP reductase; L-Fucose dehydrogenase; Gabase; Galactose-1-phosphate uridyl transferase; Glucose dehydrogenase; L-Glutamic dehydrogenase; Glycerol dehydrogenase:NADP specific; Isocitric dehydrogenase; Malic enzymes; 5,10-Methylenetetrahydrofolate dehydrogenase; 6-Phosphogluconate dehydrogenase and Succinic semialdehyde dehydrogenase.

Typical Assay Procedure (Enzymatic Determination):

Principle:

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

Reagents:

1. Triethanolamine buffer (0.1 M): 1.86 g TEA·HCl/80 ml distilled water; adjust the pH to 7.6 with 1 M NaOH; adjust volume to 100 ml.
2. Magnesium Chloride (0.1 M): 2.03 g $MgCl_2 \cdot 6H_2O$/100 ml distilled water.
3. DL-Isocitrate (14 mM): 4 mg DL-Isocitrate trisodium salt/1 ml TEA buffer (Reagent 1).
4. Isocitrate dehydrogenase, from porcine heart: 5 mg protein/ml = ~ 4 U/mg.

Sample

Dissolve 50 mg NADP in 50 ml distilled water (volumetric flask).

Wavelength:	340 nm; e340 = 6.3 [$mmol^{-1} \times 1 \times cm^{-1}$]
	334 nm; e334 = 6.18 [$mmol^{-1} \times 1 \times cm^{-1}$]
	365 nm; e365 = 3.4 [$mmol^{-1} \times 1 \times cm^{-1}$]
Light Path:	1 cm
Temperature:	20-25°C
Total Volume:	2.82 ml
Sample Volume:	0.10 ml

Pipette into a cuvette:

buffer	(Reagent 1)	2.50 ml	
$MgCl_2$	(Reagent 2)	0.10 ml	
DL-Isocitrate	(Reagent 3)	0.10 ml	
Sample		0.10 ml	mix, read the absorbance A_1. Start the reaction by addition of
ICDH	(Reagent 4)	0.02 ml	mix, read the absorbance A_2. Add
ICDH	(Reagent 4)	0.02 ml	mix, read the absorbance A_3 (absorbance due to the enzyme).

Calculation:

Availability:

Catalog Number	Description	Size
101166	b-Nicotinamide Adenine Dinucleotide Phosphate, Disodium Salt	50 mg 100 mg 250 mg 500 mg 1 g 5 g
194715	b-Nicotinamide Adenine Dinucleotide Phosphate, Disodium Salt, Cell Culture Reagent	25 mg 50 mg 100 mg 250 mg 500 mg 1 g
194777	b-Nicotinamide Adenine Dinucleotide Phosphate, Monopotassium Salt	10 mg 25 mg 50 mg 100 mg 500 mg

References:

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