

Product Information

β-Nicotinamide adenine dinucleotide 2'-phosphate reduced tetrasodium salt hydrate

≥93% (HPLC)

N1630

Product Description

CAS Registry Number: 2646-71-1

Synonyms: β-NADPH, Coenzyme II reduced tetrasodium salt, 2'-NADPH hydrate, NADPH, TPNH, Triphosphopyridine nucleotide reduced tetrasodium salt, NADPH Na₄, TPNH₂ Na₄, Dihyronicotinamide adenine dinucleotide phosphate tetrasodium salt

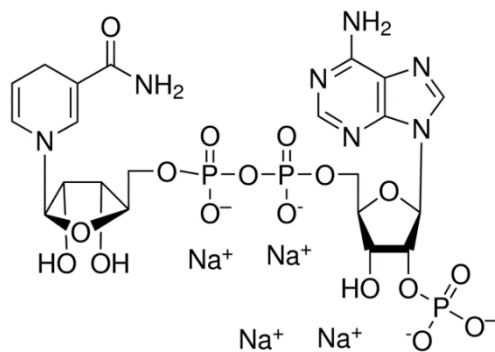
Molecular Formula: C₂₁H₂₆N₇Na₄O₁₇P₃ • xH₂O

Formula Weight: 833.35 (anhydrous basis)

E^m_M (340nm) = 6.22 (pH >10)

A_{260nm} / A_{340nm} = 2.32

Structure:



β-Nicotinamide adenine dinucleotide 2'-phosphate (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. β-NADPH transfers H⁺ and 2e⁻ 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.¹

Enzymes that use 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. β-NADPH is also involved with cytochrome P450 electron transport systems.²

This listing of β-Nicotinamide adenine dinucleotide phosphate reduced form, N1630, is prepared by the chemical reduction of β-Nicotinamide adenine dinucleotide phosphate. Several theses³⁻⁷ and dissertations⁸⁻¹³ have cited use of N1630 in their research protocols.

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

It is recommended to store N1630 desiccated at -20 °C, protected from light. The normal impurities and/or decomposition products are β-NADP and Monophosphoadenosine 5'-diphosphoribose.

It is suggested to prepare β-NADPH solutions fresh and use promptly, unless you are sure that this is an unnecessary precaution for your work. However, it has been reported that 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.¹⁴ One publication has investigated the solution stability of NADPH.¹⁵

Preparation Instructions

β-NADPH is tested for solubility in 0.01 M NaOH at 50 mg/mL.

References

1. Wood, W.B. *et al.*, *Biochemistry: A Problems Approach*. W.A. Benjamin, Inc. (Menlo Park, CA), p. 195 (1974).
2. Berg, J.M. *et al.*, *Biochemistry*, 5th edition. W.H. Freeman and Co. (New York, NY), p. 564 (2002).
3. Evans, Julie, "Application of Capillary Zone Electrophoresis Methods for the Investigation of *In Vitro* Drug Metabolism". Sheffield Hallam University, M.Ph. thesis, p. 58 (2000).
4. Shan, Jing, "Adrenomedullin regulates neuroendocrine and central autonomic functions". University of Alberta, M.Sc. thesis, pp. 29, 91 (2000).
5. Ortega, Jaime Bautista, "Polyunsaturated Fatty Acid Metabolism in Broiler Chickens: Effects of Maternal Diet". Oregon State University, M.S. thesis, p. 65 (2007).
6. Lee, Jong-Sun, "Discovery of a Novel Adenosine 5'-phosphosulfate (APS) Reductase from the Methanarcheon *Methanocaldococcus jannaschii*". Baylor University, M.S. thesis, p. 11 (2010).
7. Vonk, Alex, "Regulation of the rat hepatic NADPH-cytochrome P450 oxidoreductase by glucocorticoids". University of Toronto, M.Sc. thesis, p. 58 (2014).
8. Jing, Hao, "Chemical and Biological Effects of Lysine- and Casein-Sugar (Glucose, Fructose, and Ribose) Maillard Reaction Products". University of British Columbia, Ph.D. dissertation, pp. 66, 145, 146 (2003).
9. Bunaciu, Rodica Petruta, "The effect of polychlorinated biphenyls on liver tumor promotion: a role for Kupffer cells?" University of Kentucky, Ph.D. dissertation, p. 61 (2005).
10. Latorre, Elisa, "Multidrug resistance proteins (MRP) transport the cytokine/nuclear protein High Mobility Group Box 1 (HMGB1) across membranes". The Open University, Ph.D. dissertation, p. 22 (2007).
11. Fink, Kristin, "Toxins in Renal Disease and Dialysis Therapy: Genotoxic Potential and Mechanisms". Julius-Maximilians-Universität Würzburg, Dr. rer. nat. dissertation, p. 60 (2008).
12. Ingold, Irina, "Interrogating the *in vivo* significance of selenium-based catalysis of GPX4 for mammalian development and survival". Technischen Universität München, Dr. rer. nat. dissertation, p. 27 (2017).
13. Rebolledo, Carolyne Andrea Lespay, "The progressive brain damage observed following perinatal asphyxia is sustained by a long-term impairment of redox homeostasis: effect of nicotinamide". Universidad de Chile, Ph.D. dissertation, p. 20 (2019).
14. Passonneau, J.V., and Lowry, O.H., *Enzymatic Analysis. A Practical Guide*. Humana Press (Totowa, NJ), p. 15 (1993).
15. Wu, J.T. *et al.*, *Clin. Chem.*, **32(2)**, 314-319 (1986).

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Technical Assistance

Visit the tech service page at [SigmaAldrich.com/techservice](https://www.sigmaaldrich.com/techservice).

Standard Warranty

The applicable warranty for the products listed in this publication may be found at [SigmaAldrich.com/terms](https://www.sigmaaldrich.com/terms).

Contact Information

For the location of the office nearest you, go to [SigmaAldrich.com/offices](https://www.sigmaaldrich.com/offices).

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the U.S. and Canada.

MilliporeSigma, and Sigma-Aldrich are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates. All other trademarks are the property of their respective owners. Detailed information on trademarks is available via publicly accessible resources.
© 2022 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.

N1630pis Rev 03/22 DAG,NA,GCY,MAM

**MILLIPORE
SIGMA**