

Nicotinamide Adenine Dinucleotide (NAD)

Catalog # **NA01-C59**

Lot # **K4488-16**

CAS 53-84-9

Product Description

Molecular Formula: C₂₁H₂₇N₇O₁₄P₂

Molecular Weight: 663.43 g/mol

Physical Appearance: white powder

pH of Solution: 2.0-4.0 (100 mg/mL water)

Alternative name(s)

β-nicotinamide adenine dinucleotide, Coenzyme-I, β-NAD⁺, Diphosphopyridine nucleotide, β-NAD, β-DPN, DPN, Nadide, NAD, Cozymase, β-nicotinamide adenine dinucleotide (free acid)

Storage and Stability

Transport product sealed, dry, and protected from light at ambient temperature. Store product dry and protected from light. For long term storage keep between -25°C and -15°C.

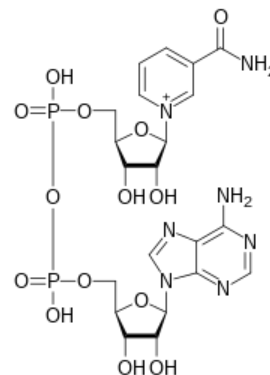
Scientific Background

Nicotinamide adenine dinucleotide (NAD) is a coenzyme necessary for the catalytic reaction of certain metabolic enzymes found in all living cells (1). It consists of two nucleosides joined by a pyrophosphate (2). Enzymes catalyze the reversible transfer of a hydride ion (H⁻) from the substrate molecule to NAD to form the reduced product NADH. The reaction is easily reversible, when NADH reduces another molecule and is re-oxidized to NAD⁺. Thus, the coenzyme can continuously cycle between the NAD⁺ and NADH forms without being consumed (3). Laboratory applications of this enzyme include biocatalytic synthesis reactions, and kinetic studies. It can also be used as a cofactor in various diagnostic tests.

References

1. Pollak N, Dölle C, Ziegler M. The power to reduce: pyridine nucleotides—small molecules with a multitude of functions. *Biochem J.* 2007 Mar 1;402(2):205-18. doi: 10.1042/BJ20061638. PMID: 17295611; PMCID: PMC1798440.
2. Alfred D. Winer. Crystallization of Nicotinamide Adenine Dinucleotide, *Journal of Biological Chemistry*, Volume 239, Issue 10, 1964, Pages PC3598-PC3600, ISSN 0021-9258. [https://doi.org/10.1016/S0021-9258\(18\)97765-3](https://doi.org/10.1016/S0021-9258(18)97765-3).
3. Katsyuba E, Romani M, Hofer D, Auwerx J. NAD⁺ homeostasis in health and disease. *Nat Metab.* 2020 Jan;2(1):9-31. doi: 10.1038/s42255-019-0161-5. Epub 2020 Jan 20. PMID: 32694684.

Molecular Structure



Purity Analysis

Purity:	≥99% (HPLC)
Assay:	≥97% (UV)
Sodium Content:	≤1% (IC)
Water Content:	≤5% (KF)
Pb:	≤0.1 ppm
As:	≤0.1 ppm
Hg:	≤0.1 ppm
Cd:	≤0.1 ppm
Total Microbe:	≤750 CFU/g
Coliform:	<3MPN/g
Mold and Yeast:	≤50 CFU/g
Staphylococcus aureus:	Not Detected
Salmonella:	N.D
Methanol:	≤0.05%
Ethanol:	≤1%
Plasticizer:	conforms

Nicotinamide Adenine Dinucleotide (NAD)

Catalog #	NA01-C59
CAS #	53-84-9
Lot #	K4488-16
Expiration Date	2024-08-16
Purity	≥99% (HPLC)
Format	White powder
Stability	Two years
Storage & Shipping	Transport product sealed, dry, and protected from light at ambient temperature. Store product dry and protected from light. For long term storage keep between -25°C and -15°C.

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SAFETY DATA SHEET

Article 1 - Product Identification

Product Name: Nicotinamide Adenine Dinucleotide (NAD)**Catalog # NA01-C59**

This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.

Supplier's Name: SignalChem Diagnostics Inc.
Street Address: 110-13120 Vanier Place
City, Prov. Postal Code: Richmond, BC, V6V 2J2
Country: Canada
Fax: 604-232-4601
EMERGENCY PHONE: 604-232-4600

Article 2 - Hazard Identification

Classification of Substance (GHS)

Not a hazardous substance or mixture.

Label Elements

Not a hazardous substance or mixture.

Other hazards: None

Article 3 - Composition/Information on Ingredients

Product Name(s): Nicotinamide Adenine Dinucleotide (NAD)
β-nicotinamide adenine dinucleotide
Coenzyme-I
β-NAD⁺
Diphosphopyridine nucleotide
β-NAD
β-DPN
DPN
Nadide
NAD
Cozymase I
β-nicotinamide adenine dinucleotide (free acid)
Chemical Name: β-Nicotinamide Adenine Dinucleotide
Molecular Formula: C₂₁H₂₇N₇O₁₄P₂
CAS Number: 53-84-9
Concentration: ≥99%

Article 4 - First-aid Measures

- **General information:** Consult a physician and provide this SDS.
- **After inhalation:** Breathe in fresh air. If victim cannot breathe, give artificial respiration and consult a physician.
- **After skin contact:** Immediately wash with soap and plenty of water and rinse thoroughly. Consult a physician.
- **After eye contact:** Rinse opened eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Consult a physician.
- **After swallowing:** Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

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Article 5 - Fire-fighting Measures

- **Suitable extinguishing media:** Use water spray, extinguishing powder, carbon dioxide, or other appropriate measure that is suitable to the environment.
- **Specific hazards arising from the substance or mixture:**
 - Carbon oxides
 - Nitrogen oxides (NOx)
 - Oxides of phosphorus
 - Combustible.
 - Risk of dust explosion.
 - Development of hazardous combustion gases or vapours possible in the event of fire.
- **Special protective equipment and precautions for fire-fighters:** In the event of fire, wear self-contained breathing apparatus.
- **Further information:** Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Article 6 – Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Apply standard laboratory practices and personal protective equipment. Avoid breathing dust, vapors, mist, or gas. Ensure adequate ventilation.
- **Environmental precautions:** Do not allow to enter drains.
- **Methods and materials for containment and cleaning up:** Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.
- **Reference to other sections:** For disposal see section 13.

Article 7 - Handling and Storage

- **Precautions for safe handling:** Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.
- **Conditions for safe storage:** Keep container upright, tightly closed, and dry. See product datasheet for recommended storage temperature

Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:**
 - Contains no substances with occupational exposure limit values.
- **Appropriate engineering controls:**
 - Apply adequate ventilation including mechanical exhaust or laboratory fume hood. Follow standard laboratory practices. Change contaminated clothing. Wash hands after working with substance.
- **Individual protection measures:**
 - Respiratory protection:**
 - Use appropriate respirator if there is inadequate ventilation when dusts are generated.
 - Hand protection:**
 - In case of contact through splashing, wear nitrile rubber gloves with thickness >0.11mm and break through time > 30 min. In case of full contact, wear butyl-rubber gloves with thickness >0.4mm and break through time > 480 min. Use proper glove removal technique to avoid skin contact. Discard gloves after use by following the applicable laboratory regulations. Wash and dry hands.
 - Eye/face protection:**
 - Safety goggles with side-shields approved under appropriate government standards.
 - Skin/body protection:**
 - Use appropriate clothing, footwear and any additional protection measures to protect from splashing or contamination.

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Article 9 – Physical and Chemical Properties

Appearance: White powder	Danger of explosion: Product does not present an explosion hazard.
Odour/Odour Threshold: odourless/ threshold N/A	Explosion limits: Not available.
pH: No data available.	Decomposition temperature: Not available.
Melting point/freezing point: No data available.	Vapor pressure at 20 °C: Not available.
Boiling point/Boiling range: No data available.	Density: Not determined.
Flash point: Not applicable	Relative density: Not determined.
Flammability (solid, gaseous): This product is not flammable	Vapor density: Not determined.
Ignition temperature: Not determined.	Evaporation rate: Not determined.
Auto-igniting: Product is not self-igniting.	Solubility in / Miscibility with Water: Fully soluble

Article 10 - Stability and Reactivity

- **Reactivity:** No data available
- **Chemical stability:** The product is chemically stable under standard ambient conditions (room temperature)
- **Possible hazardous reactions:** No dangerous reaction known under conditions of normal use.
- **Conditions to avoid:** Heat and moisture.
- **Incompatible materials:** Not determined.
- **Hazardous decomposition products:** Not determined.

Article 11 - Toxicological Information

- **Acute toxicity:** Not classified based on available information.
- **LD/LC50:** No data available.
- **Skin corrosion/irritation:** No data available.
- **Serious eye damage/eye irritation:** No data available.
- **Respiratory or skin sensitization:** No data available.
- **Germ cell mutagenicity:** No data available.
- **Carcinogenicity:** No components are listed in IARC, or NTP, or OSHA, or ACGIH.
- **Reproductive toxicity:** No data available.
- **Teratogenicity:** No data available.
- **Specific target organ toxicity - single exposure/ - repeated exposure (GHS):** No data available.
- **Aspiration hazard:** No data available.
- **Potential health effects:**
Inhalation: No data available.
Ingestion: No data available
Skin: No data available
Eyes: No data available
- **Signs and Symptoms of Exposure:** No data available
- **Synergistic effects:** No data available.
- **Additional Information:** To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. (nicotinamide-adenine dinucleotide)
 Substance which occurs in the human body under physiological conditions. (nicotinamide-adenine dinucleotide)
 Hazardous properties cannot be excluded but are unlikely when the product is handled appropriately. (nicotinamide-adenine dinucleotide)

Article 12 - Ecological Information

- **Eco-toxicity:** No data available.
- **Biodegradability:** No data available.
- **Bio-accumulative potential:** No data available.
- **Mobility in soil:** No data available.
- **PBT and vPvB assessment:** No data available.
- **Other adverse effects:** No data available.

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Article 13 - Disposal Considerations

- **Disposal methods:** Dispose of in accordance with applicable national, regional, or local laws and regulations. For additional handling information and protection of employees please refer to Article 7 and 8.
- **Contaminated packaging:** Dispose of in accordance with applicable official regulations.

Article 14 - Transport Information

- **DOT:** Not regulated as a dangerous good.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

Article 15 – Regulatory Information

- **WHMIS Classification:** Non-hazardous.
- **GHS label elements:** Not applicable.
- **Signal word:** Not applicable.
- **Hazard statements:** Not applicable.

Article 16 - Other Information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. SignalChem shall not be held liable for any damage resulting from handling or from contact with the above product. See the Technical Specification, Packing Slip, Invoice, and Product Catalog for additional terms and conditions of sale.

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