

SAFETY DATA SHEET



NADH, approx. 100%

Version
2.0

Revision Date:
04-26-2022

Date of last issue: 11-04-2021
Date of first issue: 08-31-2015

SECTION 1. IDENTIFICATION

Product name : NADH, approx. 100%

Product code : 10107735001

Manufacturer or supplier's details

Company name of supplier : Roche Diagnostics Deutschland GmbH

Address : 116 Sandhoferstrasse
Mannheim, 68305
Germany

Telephone : +496217590

Telefax : +496217592890

E-mail address : info.dia-sds@roche.com

Emergency telephone

In case of emergencies: : CHEMTREC +1 703-741-5970 /
1-800-424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Chemical raw material

Restrictions on use : For professional users only.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Combustible dust

GHS label elements

Signal Word : Warning

Hazard Statements : May form combustible dust concentrations in air.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Substance name : Dihyronicotinamide-adenine dinucleotide, disodium salt

CAS-No. : 606-68-8

Components

Chemical name	CAS-No.	Concentration (% w/w)
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Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2)	606-68-8	<= 100
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Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

- General advice : Do not leave the victim unattended.
- If inhaled : Move to fresh air.
If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.
- In case of skin contact : If on skin, rinse well with water.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Rinse mouth with water.
- Most important symptoms and effects, both acute and delayed : None known.
- Notes to physician : The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Carbon dioxide (CO2)
Dry powder
Water spray jet
Foam
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Specific hazards during fire fighting : No information available.
- Hazardous combustion products : In case of fire hazardous decomposition products may be produced such as:
Oxides of phosphorus
Sodium oxides
Nitrogen oxides (NOx)
Carbon oxides

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- Further information : Standard procedure for chemical fires.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Avoid dust formation.
- Environmental precautions : Local authorities should be advised if significant spillages cannot be contained.
- Methods and materials for containment and cleaning up : Pick up and arrange disposal without creating dust.
Sweep up and shovel.
Keep in suitable, closed containers for disposal.

SECTION 7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Provide appropriate exhaust ventilation at places where dust is formed.
- Advice on safe handling : For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
- Conditions for safe storage : Electrical installations / working materials must comply with the technological safety standards.
- Further information on storage conditions : See label, package insert or internal guidelines
- Materials to avoid : No materials to be especially mentioned.
- Storage temperature : Protected from heat and light
- Further information on storage stability : No decomposition if stored and applied as directed.
- Packaging material : Suitable material: Stainless steel, Polyethylene bag in metal drum, glass

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

Personal protective equipment

- Respiratory protection : No personal respiratory protective equipment normally requi-

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red.

Hand protection

In case of contact through splashing:
Material : Nitrile rubber
Break through time : > 30 min
Glove thickness : > 0.11 mm

In case of full contact:
Material : butyl-rubber
Break through time : > 480 min
Glove thickness : > 0.4 mm

Remarks : Wear appropriate protective gloves to prevent skin contact.
Replace torn or punctured gloves promptly.
Eye protection : Safety glasses
Skin and body protection : Protective suit
Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Crystalline powder

Color : light yellow

Odor : odorless

Odor Threshold : Not applicable

pH : Not applicable

Melting point/range : (1,016 hPa)
Method: OECD Test Guideline 102
GLP: yes
Decomposition

Boiling point/boiling range : (1,013 hPa)
Method: OECD Test Guideline 103
GLP: yes
Decomposition

Flash point : Not applicable

Evaporation rate : No data available

Flammability (solid, gas) : The product is not flammable.
Method: Regulation (EC) No. 440/2008, Annex, A.10
GLP: yes

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Self-ignition	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	< 0.0073 hPa (68 °F / 20 °C) Method: OECD Test Guideline 104 GLP: yes < 0.0073 hPa (77 °F / 25 °C) Method: OECD Test Guideline 104 GLP: yes < 0.0073 hPa (122 °F / 50 °C) Method: OECD Test Guideline 104 GLP: yes
Relative vapor density	:	Not applicable
Relative density	:	1.955 (68 °F / 20 °C) Reference substance: Water Method: OECD Test Guideline 109 GLP: yes
Density	:	1.955 g/cm ³ (68 °F / 20 °C) Method: OECD Test Guideline 109 GLP: yes
Solubility(ies) Water solubility	:	>= 712 g/l slightly soluble (72.5 °F / 22.5 °C) pH: 7 Method: OECD Test Guideline 105 GLP: yes
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	log Pow: < -1.96 pH: 7 Method: OECD Test Guideline 107 GLP: yes
Autoignition temperature	:	No data available
Decomposition temperature	:	284 °F / 140 °C
Viscosity Viscosity, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive Expert judgment

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Oxidizing properties	:	The substance or mixture is not classified as oxidizing. Expert judgment
Surface tension	:	69.22 mN/m, 68 °F / 20 °C, OECD Test Guideline 115, GLP: yes
Molecular weight	:	709.42 g/mol
Particle Size Distribution	:	D10 = 7.7 µm D50 = 38.7 µm D90 = 130.6 µm Type of distribution: volume distribution Measurement method: OECD Test Guideline 110 Measurement technique: laser diffraction

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Exothermic reaction
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Potential for exothermic hazard Risk of dust explosion. Stable under recommended storage conditions. No hazards to be specially mentioned.
Conditions to avoid	:	> 80 °C Exposure to moisture.
Incompatible materials	:	Strong oxidizing agents
Hazardous decomposition products	:	In case of fire hazardous decomposition products may be produced such as: Carbon oxides Nitrogen oxides (NO _x) Oxides of phosphorus Sodium oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Components:

Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2):

Acute oral toxicity	:	(Rat, female): > 2,000 mg/kg Method: OECD Test Guideline 423 GLP: yes
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Not classified based on available information.

Components:**Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2):**

Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 439
Result : No skin irritation
GLP : yes

Serious eye damage/eye irritation

Not classified based on available information.

Components:**Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2):**

Species : Bovine cornea
Result : No eye irritation
Exposure time : 4 h
Method : OECD Test Guideline 437
GLP : yes

Respiratory or skin sensitization**Skin sensitization**

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Components:**Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2):**

Test Type : KeratinoSens assay
Assessment : Does not cause skin sensitization.
Method : OECD Test Guideline 442D
GLP : yes

Test Type : Direct Peptide Reactivity Assay (DPRA)
Method : OECD Test Guideline 442C
GLP : yes

Germ cell mutagenicity

Not classified based on available information.

Components:**Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2):**

Genotoxicity in vitro : Test Type: Microbial mutagenesis assay (Ames test)
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation

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Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)

Result: negative

GLP: yes

Test Type: Microbial mutagenesis assay (Ames test)

Test system: Escherichia coli

Metabolic activation: with and without metabolic activation

Method: Mutagenicity (Escherichia coli - reverse mutation assay)

Result: negative

GLP: yes

Carcinogenicity

Not classified based on available information.

IARC No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Not classified based on available information.

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

SECTION 12. ECOLOGICAL INFORMATION
Ecotoxicity
Components:
Adenosine 5'-(trihydrogen diphosphate), P'.->.5'-ester with 1,4-dihydro-1-.beta.-D-ribofuranosylnicotinamide, sodium salt (1:2):

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l

End point: Immobilization

Exposure time: 48 h

Test Type: semi-static test

Analytical monitoring: yes

Method: OECD Test Guideline 202

GLP: yes

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Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
 End point: Growth rate
 Exposure time: 72 h
 Test Type: static test
 Analytical monitoring: yes
 Method: OECD Test Guideline 201
 GLP: yes

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.
 Remarks: Display primary data instead of "Not classified based on available information."

Chronic aquatic toxicity : This product has no known ecotoxicological effects.
 Remarks: Display primary data instead of "Not classified based on available information."

Toxicity Data on Soil : Not expected to adsorb on soil.
 Remarks: Display primary data instead of "Not classified based on available information."

Other organisms relevant to the environment : No data available
 Remarks: Display primary data instead of "Not classified based on available information."

Persistence and degradability
Components:
Adenosine 5'-(trihydrogen diphosphate), Pⁱ->5'-ester with 1,4-dihydro-1-β-D-ribofuranosylnicotinamide, sodium salt (1:2):

Biodegradability : aerobic
 Inoculum: activated sludge, non-adapted
 Concentration: 69 mg/l
 Result: Readily biodegradable.
 Biodegradation: 90 %
 Exposure time: 28 d
 Method: OECD Test Guideline 301F
 GLP: yes

Bioaccumulative potential
Components:
Dihyronicotinamide-adenine dinucleotide, disodium salt:

Partition coefficient: n-octanol/water : log Pow: < -1.96
 pH: 7
 Method: OECD Test Guideline 107
 GLP: yes

Mobility in soil

No data available

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Other adverse effects

Product:

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Can be disposed as waste water, when in compliance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

Domestic regulation

49 CFR

Not regulated as a dangerous good

Special precautions for user

Remarks : Not dangerous goods in the meaning of ADR/RID, ADN, IMDG-Code, ICAO/IATA-DGR

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.



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SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Combustible dust

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

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Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:

AIIC : On the inventory, or in compliance with the inventory

DSL : All components of this product are on the Canadian DSL

NZIoC : On the inventory, or in compliance with the inventory

ENCS : Not in compliance with the inventory

ISHL : Not in compliance with the inventory

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- KECI : Not in compliance with the inventory
- PICCS : Not in compliance with the inventory
- IECSC : Not in compliance with the inventory
- TCSI : On the inventory, or in compliance with the inventory
- TSCA : All substances listed as active on the TSCA inventory
- TECI : Not in compliance with the inventory

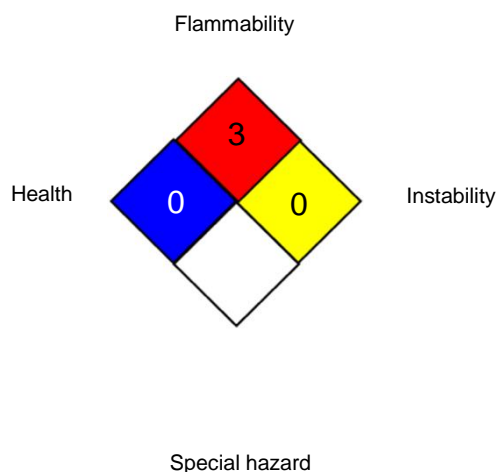
TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

NFPA 704:



HMIS® IV:

HEALTH	/	0
FLAMMABILITY		3
PHYSICAL HAZARD		0

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Distributor

MilliporeSigma
3050 Spruce Street
SAINT LOUIS
MO 63103 USA

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Haz-

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ardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECL - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / Z8 / 2104