

Adipic acid, compound with Hexane-1,6-diamine (1:1)

[Chemical Identity](#)

<i>Brand names</i>	Nylon salt	<i>CAS number</i>	3323-53-3
<i>Chemical name (IUPAC)</i>	Adipic acid, compound with Hexane-1,6-diamine (1:1)	<i>Molecular formula</i>	C₆H₁₆N₂.C₆H₁₀O₄
<i>Synonyms</i>	Nylon 66 salt; AH salt; Hexamethylenediamine adipate	<i>Molecular weight</i>	262.35 g/mol

[Applications](#)

Nylon salt is mainly used as a precursor for the production of polyamide Nylon 6-6 or other polyamides.

[Safety Assessment, Exposure and Risk Management Recommendations](#)

[Physical and chemical properties](#)

Property	Result
Physical state	Solid at room temperature
Colour	white
Odour	Odourless
Boiling point	Decomposition before boiling
Melting point range	192-202 °C at atmospheric pressure
Flammability	Non flammable
Water solubility	Readily soluble
Octanol water partition	Low potential for bioaccumulation

[Health effects](#)



Nylon salt is not classified as dangerous for human health. Safety measures must be observed for industrial uses, for more details, consult the Safety Data Sheet.

[Environmental effects](#)



Nylon salt is readily biodegradable, not persistent and has a low potential for bioaccumulation. Industrial emissions, disposal, treatment or recycling must comply with applicable regulations to preserve environment.

[Regulatory information and certifications](#)

[Classification and labelling](#)

EU regulation (EC) 1272/2008 (CLP)

Classification

Adipic acid, compound with hexane-1,6-diamine (1:1) is not classified regarding physical and chemical hazards and is not classified either for human health or for environment.

Labelling

No pictogram, no signal word, no Hazard or Precautionary statement.

[Registration and certification](#)

**EU regulation on chemicals (EC) 1907/2006 (REACH)
ISO 9001: 2008 certified**

GPS Safety Summary

This Product Safety Summary is intended to provide a general overview of the chemical substance in the context of ICCA Global Product Strategy. The information on the Summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the (extended) Safety Data Sheet (e)SDS for the chemical substance.

Adipic acid, compound with Hexane-1,6-diamine (1:1)

General Statement

Adipic acid, compound with hexane-1,6-diamine (1:1), also named Nylon salt or AH salt, is a white crystalline powder. This organic compound is obtained from adipic acid and hexane-1,6-diamine (named also HMD).

It is mainly used as a precursor for the production of polyamide Nylon 6-6 or other polyamides.

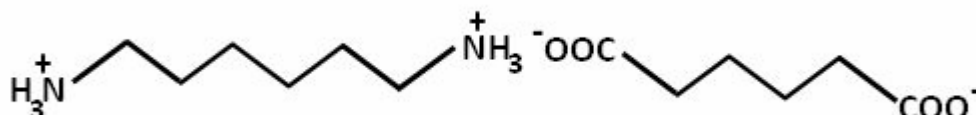
The pure substance is an intermediate for polymers, manufactured and used only in industry. It is not classified as dangerous for human health and for environment, based on available data.

Consumer exposure to adipic acid compound with hexane-1,6-diamine (1:1) is not expected.

Chemical Identity

Name:	Adipic acid, compound with hexane-1,6-diamine (1:1)
Brand names:	Nylon salt
Chemical name (IUPAC):	Adipic acid, compound with hexane-1,6-diamine (1:1)
Synonyms:	Nylon 66 salt; AH salt; Hexamethylenediamine adipate (1:1)
CAS number(s):	3323-53-3
EC number:	222-037-3
Molecular formula:	$C_6H_{16}N_2 \cdot C_6H_{10}O_4$

Structure:



Uses and applications

Nylon salt is produced by neutralisation of hexamethylenediamine in aqueous solution with adipic acid. The aqueous solution of the salt is an intermediate for the production of polyamide 6-6 and other polyamides, mainly for plastics and textile industries. The solid salt is produced by crystallisation. It makes storage and transport easier.

Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Physical state	Solid at 20°C and atmospheric pressure
Form	Crystalline powder
Colour	White
Odour	Odourless
Molecular weight	262.35g/mol
Melting point / range	192 - 202°C at atmospheric pressure
Boiling point	not applicable (decomposition before boiling)
Flash point	Not applicable (solid substance)
Flammability	Non flammable
Explosive properties	Non explosive
Self-ignition temperature	> 400°C at atmospheric pressure
Vapour pressure	Negligible at 20°C (by calculation)
Water solubility	480 g/l at 20°C
Octanol Water partition coefficient (log Kow)	- 4.4 at 25°C

Based on available data, adipic acid, compound with hexane-1,6-diamine (1:1) is not classified regarding physical and chemical hazards, according to EU regulation (EC) 1272/2008.

Other hazard which do not result in classification:

The pure substance is a combustible and divided solid which may form an explosive dust-air mixture.

Health Effects

Human Health Safety Assessment

Effect Assessment	Result
Acute Toxicity Oral/inhalation/dermal	Very low acute oral and dermal toxicity, not resulting in classification No data available by inhalation (route of exposure not relevant, the substance is solid and vapour emissions are not expected)
Irritation / corrosion Skin/eye/respiratory tract	Not irritating to skin Slightly irritating to eyes, not resulting in classification
Sensitisation	No skin sensitising effect

Toxicity after repeated exposure Oral/inhalation/dermal	Very low toxicity after repeated exposure by inhalation (by analogy) and oral route, not resulting in classification No data on dermal repeated toxicity but expected to be very low
Genotoxicity / Mutagenicity	Neither mutagenic nor genetic effect, based on <i>in vitro</i> and <i>in vivo</i> tests results
Carcinogenicity	No evidence of carcinogenic activity based on genotoxicity tests results
Toxicity for reproduction	No adverse effect on fertility and development (by analogy)

All these results are based on available data. Regarding toxicological hazard, adipic acid, compound with hexane-1,6-diamine (1:1) is not classified according to EC 1272/2008 regulation criteria.

Environmental Effects

Environment Safety Assessment

Effect Assessment	Result
Aquatic Toxicity	Harmful to aquatic invertebrates Not harmful to fish and algae

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not potentially bioaccumulative
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB

Available data, in aqueous solution, on the 3 trophic levels (fish, algae and invertebrates) show that invertebrates is the most sensitive organism and the less sensitive is fish. In addition, the Nylon salt rapidly dissociates in adipic acid and hexamethylenediamine, both of them acutely harmful to aquatic invertebrates, therefore the Nylon salt may be considered as harmful to aquatic organisms.

Nylon salt is readily biodegradable and not potentially bioaccumulative, it is therefore not classified as dangerous for the environment, according to EU regulation (EC) 1272/2008.

Exposure

Human health

Nylon salt is manufactured in industry in closed processes which ensure that the risk is controlled. Where there is a risk of exposure to the substance, during (un)loading, sampling, analysis or maintenance operations, the exposure should be kept as minimum as possible by the use of appropriate risk management measures as suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.

Environment

Physico-chemical properties indicate that the environmental distribution of the Nylon salt would be mainly the water where it would rapidly dissociate in adipic acid and hexamethylenediamine. Both of them are harmful to aquatic organisms but they are readily biodegradable and have a low potential for bioaccumulation, so they would not be persistent.

Nylon salt has a low potential for volatility, gaseous emissions in the air are not expected.

Risk Management Recommendations

Human health

For industrial uses of Nylon salt and as recommended for the use of any chemical product, workers must be well informed and trained and must refer to the Safety Data Sheet (SDS).

Where there is a risk of exposure to Nylon salt (during (un)loading, mixing, sampling, analysis or maintenance operations), it must be controlled by handling the substance under an adequate and efficient ventilation. Appropriate Personal Protective Equipment (PPE) must be worn (safety goggles, gloves, protective suit) as recommended in the SDS. In case of exposure to dust, a respirator with approved filter should be used. General hygiene measures are required to ensure safe handling of the substance: Emergency equipment immediately accessible; use well-maintained PPE; wash hands and skin following contact; do not eat, drink or smoke at the workplace.

Environment

All industrial aqueous releases that may contain the substance must be directed to a waste water treatment plant or incinerated in compliance with local regulation.

Disposal, treatment or recycling of industrial waste (including aqueous and air emissions) must comply with applicable regulations to preserve environment.

State Agency Review

Adipic acid compound with hexane-1,6-diamine (1:1) has been registered under:

EU regulation (EC) 1907/2006 (REACH)

Adipic acid compound with hexane-1,6-diamine (1:1) has been reviewed under the following regulatory and/or voluntary programmes:

OECD High Production Volume Chemicals Programme, published by UNEP in 2005

Regulatory Information / Classification and Labelling

Substance classification and labelling according to EU regulation (EC) 1272/2008 (CLP):

Classification

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Labelling

No pictogram, no signal word, no Hazard or Precautionary statement.

Contact Information within Company

For further information on this substance or Product Safety Summaries in general, please contact:

Rhodia Global Product Strategy: http://www.rhodia.com/en/sustainability/global_product_strategy/index.tcm

Contact: globalproductstrategy@eu.rhodia.com

Additional Information

ICCA Global Product Strategy: <http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

(extended) Safety Data Sheet available on demand: http://www.rhodia.com/en/contact/contact_form_business.tcm

Glossary of technical terms: http://www.rhodia.com/en/sustainability/global_product_strategy/glossary/index.tcm

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Disclaimer

The information provided in the present Safety Summary is based on European data available in REACH regulatory dossier (EC N°1907/2006) and is correct to the best of our knowledge, information and belief at the date of its publication. Such information is only intended to provide a general overview of the chemical substance in the context of ICCA Global Product Strategy and is not to be considered as a warranty or quality specification. It does not replace the safety data sheet and technical sheets. Thus, the information provided in this Safety Summary only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.