

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

* 1 Identification of substance/preparation and of the company/undertaking:

- **Product details:**
- **Trade name:** adipic acid
- **Application of the substance / the preparation** Chemicals for synthesis
- **Supplier/Manufacturer:**
Penpet Petrochemical Trading GmbH
Merkur-Park
Sieker Landstrasse 126
22143 Hamburg
Germany
Tel: +49 40 675 799 0
Fax: +49 40 675 799 99 / 88
- **Email competent person:** angelika.torges@kft.de
- **Information department:** See supplier/manufacturer
- **Emergency information:** National Poisons Information Centre Tel.: +44 (0)870 6006266

* 2 Hazards identification

- **Hazard description:**



Xi Irritant

- **Information pertaining to particular dangers for man and environment:**
R 36 Irritating to eyes.
- **Classification system:**
The classification was made according to the latest editions of the EC-lists, and expanded using company data and specialized literature.
- **GHS label elements**



Warning

- H319 - Causes serious eye irritation.
- **Response:**
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
- **Additional information:**
Aqueous solutions of the substance are acidic.
Risk of dust explosion in case of high dust concentrations in the air.

3 Composition/information on ingredients

- **Chemical characterization:**
- **CAS No. Description:**
124-04-9 adipic acid
- **Identification number(s):**
- **EINECS Number:** 204-673-3
- **Index number:** 607-144-00-9

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

Trade name: adipic acid

(Contd. of page 1)

* 4 First aid measures

- **General information:** Immediately remove any clothing soiled by the product.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Wash with water and soap.
- **After eye contact:**
Rinse the eyes with open eyelids for 10 - 15 minutes with water. Then consult a doctor or better an eye specialist.
- **After swallowing:**
Rinse out mouth and then drink plenty of water.
Seek medical treatment.
- **Information for doctor:**
- **Treatment:** Symptomatic treatment

5 Fire fighting measures

- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Use fire fighting measures that suit the environment.
- **For safety reasons unsuitable extinguishing agents:** Direct jet water
- **Special hazards caused by the material, its products of combustion or resulting gases:**
Dangerous decomposition product see chapter 10: stability and reactivity
- **Protective equipment:** Wear self-contained respiratory protective device.
- **Additional information:**
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

- **Person-related safety precautions:**
Wear protective clothing.
Ensure adequate ventilation
Avoid formation of dust.
Use respiratory protective device against the effects of fumes/dust/aerosol.
Do not smoke - keep ignition sources away
- **Measures for environmental protection:**
Do not allow product to reach sewage system or any water course.
Do not allow to penetrate the ground/soil.
- **Measures for cleaning/collecting:**
Pick up mechanically.
Avoid dust formation absolutely. If necessary pick up with a tested and approved industrial vacuum cleaner.
Send for recovery or disposal in suitable receptacles.
Dispose contaminated material as waste according to item 13.
Clean the affected area carefully; suitable cleaners are:
Warm water and cleansing agent

* 7 Handling and storage

- **Handling**
- **Information for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Keep receptacles tightly sealed.
Any deposit of dust which cannot be avoided must be regularly removed.
Avoid contact with eyes and skin.

(Contd. on page 3)

— GB —

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

Trade name: adipic acid

(Contd. of page 2)

- **Information about protection against explosions and fires:**
Dust can combine with air to form an explosive mixture.



Keep ignition sources away - Do not smoke.

Protect against electrostatic charges

- **Storage**
- **Requirements to be met by storerooms and receptacles:**
Store at ambient temperatures and at dry conditions.
Unsuitable material:
Steel
- **Information about storage in one common storage facility:**
Store away from foodstuffs.
Store away from feed.
- **Further information about storage conditions:**
Keep receptacle tightly sealed.
Protect from humidity and water.
- **Storage class** 11 Combustible solids

* 8 Exposure controls and personal protection

- **Additional information about design of technical systems:**
Install appropriate mechanical ventilation.
Protect against electrostatic charges.
- **Components with limit values that require monitoring at the workplace:**
124-04-9 adipic acid
OEL (Ireland) Long-term value: 5 mg/m³
- **Additional Occupational Exposure Limit Values for possible hazards during processing:**
Observe general threshold limit for dust.
- **Additional information:** The lists that were valid during the creation were used as basis.
- **Personal protective equipment**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Vacuum clean contaminated clothing. Do not blow or brush off contamination.
Avoid contact with the eyes.
Provide eye bath.
- **Breathing equipment:**
Not necessary if room is well-ventilated.
In case of unintended release:



In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Short term filter device:
Filter P2.

- **Protection of hands:**
Chemical resistant gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
After use of gloves apply skin-cleaning agents and skin cosmetics.

(Contd. on page 4)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

Trade name: adipic acid

(Contd. of page 3)

Material of gloves:

For undissolved solid substances following materials may be suitable:

- Nitrile rubber, NBR
- Butyl rubber, BR
- Polychloroprene rubber (CR)
- Fluorocarbon rubber (FKM)

Following data refer to aqueous saturated solution of the substance:

Suitable glove material:

- Natural rubber - NR (0,5 mm)
- Polychloropren rubber - CR (0,5 mm)
- Nitrile rubber - NBR (0,35 mm)
- Butyl rubber - Butyl (0,5 mm)
- Fluorocarbon rubber - FKM (0,4 mm)

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Penetration time of glove material:

The exact penetration time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:** Tightly sealed goggles.
- **Body protection:** Protective work clothing.

* 9 Physical and chemical properties:

General Information

Form:	Crystalline
Colour:	White
Odour:	Odourless

Change in condition:

Melting point/Melting range:	150-153°C
Boiling point/Boiling range:	330°C

• **Flash point:** 196°C (closed cup)

• **Flammability (solid, gaseous)** Product is not flammable.

• **Ignition temperature:** 420°C

• **Decomposition temperature:** 338°C

• **Danger of explosion:** Product is not explosive. However, formation of explosive air/dust mixtures is possible.

Explosion limits:

Lower: 60 g/m³

• **Vapour pressure at 159°C:** 1.3 hPa

• **Density at 20°C:** 1.37 g/cm³

Solubility in / Miscibility with

Water at 20°C: 24 g/l

• **pH-value (25 g/l) at 25°C:** 2.7

• **Segregation coefficient (n-octanol/water):** 0.08 log POW

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

Trade name: adipic acid

(Contd. of page 4)

* 10 Stability and reactivity

Thermal decomposition / conditions to be avoided:

No decomposition if used according to specifications.
To avoid thermal decomposition do not overheat.

Materials to be avoided:

Strong oxidants
Reducing agents
Bases

Dangerous reactions:

As the product is supplied it is not capable of dust explosion; however enrichment with fine dust causes risk of dust explosion
Violent reactions with above-mentioned substances.

Dangerous products of decomposition:

In the case of fire or at high temperatures the formation of the following decomposition products is possible.
Carbon monoxide and carbon dioxide

Additional information:

The aqueous solution attacks most metals.
Forms explosive mixtures with air on intense heating.

* 11 Toxicological information

Acute toxicity:**LD/LC50 values that are relevant for classification:**

Oral LD₅₀ 3600 mg/kg (rat)

Primary irritant effect:

on the skin: May cause irritation to the skin.

on the eye: Irritating effect.

Sensitization: No sensitizing effects known.

Other information (about experimental toxicology): Ames-test: negative

Additional toxicological information:

After swallowing: irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

* 12 Ecological information

Information about elimination (persistence and degradability):

Other information: The product is readily biodegradable.

Behaviour in environmental systems:

Mobility and bioaccumulation potential: Bioaccumulation is not to be expected ($\log P_{o/w} < 1$)

Ecotoxic effects:**Aquatic toxicity:**

EC₅₀/48h 86 mg/l (daphnia magna)

IC₅₀/72h 31 mg/l (des)

LC₅₀/24h (static) 172 mg/l (fathead minnow)

LC₅₀/96h 230 mg/l (leuciscus idus)

Remark: Harmful effect by pH-value shift.

Additional ecological information:

BSB5-value: 0,598

General notes:

Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water.

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Danger to drinking water is possible if large quantities leak into the ground or into water course.

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

Trade name: adipic acid

(Contd. of page 5)

13 Disposal considerations

- **Product:**
- **Recommendation:**



Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

Must be specially treated adhering to official regulations.

- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **Land transport ADR/RID (cross-border)**
- **ADR/RID class:** No hazardous good according to the regulation.
- **Maritime transport IMDG:**
- **IMDG Class:** No hazardous good according to the regulation.
- **Air transport ICAO-TI and IATA-DGR:**
- **ICAO/IATA Class:** No hazardous good according to the regulation.
- **UN "Model Regulation":** -

15 Regulatory information:

- **Markings according to EC guidelines:**
The product has been classified and marked in accordance with EC Directives / Ordinance on Hazardous Materials "EC-labelling"
- **Code letter and hazard designation of product:**



Xi Irritant

- **Risk phrases:**
36 Irritating to eyes.
- **National regulations**
- **Information about limitation of use:** Take note of Directive 94/33/EC on the protection of young people at work.
- **Water hazard class:** Water hazard class 1 (Assessment by list): slightly hazardous for water.

16 Other information:

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Reasons for amendments:**
Regulation (EC) No. 1907/2006
Regulation (EC) No. 1272/2008 /CLP
Ecological data
Completion of toxicity data
TLV

(Contd. on page 7)

— GB —

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 09.02.2010

Revision: 09.02.2010

Trade name: adipic acid

(Contd. of page 6)

Supplement of technical characteristics
General revision

· Department issuing MSDS:

KFT Chemieservice GmbH
Im Leuschnerpark. 3 D-64347 Griesheim
Postfach 1451 D-64345 Griesheim

Tel.: +49 6155 86829-0 Fax: +49 6155 86829-25

Safety Data Sheet Service: +49 6155 86829-22

· Contact: Angelika Torges**· Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

· Sources:

HSDB database

Toxnet ChemID

Chemical Carcinogenesis Research Information System (CCRIS)

ESIS (EU Existing Substances Information System)

· * Data compared to the previous version altered.

Changes have been made to chapters marked with a *, as compared to the previous version.