

GPS Safety Summary

Substance Name:

2,2'-dimethyl-2,2'-azodipropionitrile

1. General Statement

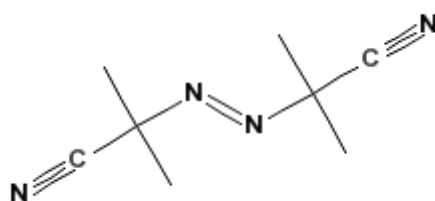
2,2'-dimethyl-2,2'-azodipropionitrile is a self-reactive white powder commonly called AZDN. The product, composed of non soluble particles of a mean size of 98 µm, is sensitive to shock and to the temperature when heated under confinement.

AZDN is solely used within industrial settings as a free radical polymerization initiator, catalyst or a chemical blowing agent. Exposure to the general population or to professional users is not expected.

Based on available data the pure substance is harmful if inhaled or swallowed and toxic for aquatic life therefore it must be handled under stringent safety conditions in accordance with the risk management measures to keep the exposure as low as possible to preserve human health and the environment.

2. Chemical Identity

Name:	2,2'-dimethyl-2,2'-azodipropionitrile
Brand names:	AZDN
Chemical name (IUPAC):	2,2'-diazene-1,2-diylbis(2-methylpropanenitrile)
CAS number:	78-67-1
EC number:	201-132-3
Molecular formula:	C ₈ H ₁₂ N ₄
Structure:	



3. Use and applications

AZDN is a self-reactive solid substance widely used as a free radical polymerization initiator to initiate or terminate the reaction of polymerization. The applications are covering the following areas: PMMA sheets, flocculants, acrylic fibers, adhesives & coatings, graft polyols.

AZDN can be also used as a catalyst agent for radical reactions in fine chemicals manufacturing and as a chemical blowing agent in foam composites manufacturing. AZDN is exclusively marketed to industrial and chemical companies as a single ingredient.

4. Physical / Chemical properties

AZDN is a self-reactive solid organic substance with the following physicochemical properties:

Property	Value
Physical state	Solid at 20°C and 1013 hPa
Form	powder
Particle size	mean particle size = 98 µm, 10% of particles with a diameter < 47 µm, 10% of particles with a diameter >166 µm.
Colour	White
Odour	Odourless
Molecular weight	164.2 g/mol
Density	1.098 g/cm ³ at 22.6–22.9°C
Vapour pressure	0.81 Pa at 25°C (OECD Test Guideline 104)
Decomposition temperature	Around 50°C
Melting point	100-105°C around 1013 hPa
Explosive / Self-reactive properties	The substance is thermally sensitive when heated under defined confinement (Koenen test). The substance is sensitive in the shock sensitivity test. (A14 Method)
Flammability / Self-ignition temperature / Oxidizing properties	Not relevant due to explosive / self-reactive properties
Water solubility	318 mg/L at 20°C (OECD Test Guideline 105)
Octanol-water partition coefficient (Log K _{ow})	1.1 at 25°C (OECD Guideline 107)

5. Health Effects

Like any reactive chemical, AZDN can be hazardous if not handled properly.

Effect Assessment	Results
Acute Toxicity Oral / inhalation / dermal	Harmful by inhalation and if swallowed. Slightly harmful by contact with skin.
Irritation / corrosion Skin / eye/ respiratory tract	Not irritating to skin. Slightly irritating to eyes. No data on respiratory irritation.
Sensitisation	Did not cause allergic reactions by skin contact in animals.
Toxicity after repeated exposure Oral / inhalation / dermal	Based on the available data, only minor or adaptive effects (liver and kidneys) were noted in animals after repeated oral exposure during approximately 8 weeks. No data for other routes.
Genotoxicity / Mutagenicity	Based on the available test data, not expected to cause genetic effects.
Carcinogenicity	No data available.
Reproductive / Developmental Toxicity	Did not cause developmental toxicity or toxicity to fertility in animals in a screening study.

6. Environmental Effects

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic organisms

Fate and behaviour	Result
Biodegradation	Not readily biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered to be PBT* or vPvB**

*: Persistent, Bioaccumulative and Toxic (PBT)

** : very Persistent and very Bioaccumulative (vPvB)

Based on its physico-chemical properties, AZDN has a low potential for volatility, is not readily biodegradable and is not expected to bioaccumulate. If released into the environment, the substance is expected to partition predominantly into aquatic compartment and not to adsorb on soil or sediment.

7. Exposure

7.1 Human health

Consumers/professionals:

AZDN is manufactured, processed and used within industrial settings.

Exposure to the general population or to professional users is not expected.

Workers:

Occupational exposure may occur either in manufacturing facilities and other industrial facilities using AZDN. Workers may be exposed during cleaning, maintenance, transfer, sampling and analysis or use as a blowing agent.

Based on the risk assessment, the exposure can be kept at a safe level (strictly below occupational exposure limits, when applied) when activities are carried out under conditions recommended in the Extended Safety Data Sheet (see Chap. 8 and Exposure Scenarios).

Procedures, controls, suitable collective and personal risk management measures, good industrial hygiene practices and risk and communication through appropriate training of workers should be implemented.

In case of exposure to the undiluted substance, workers should follow the first aid measures recommended in Safety Data Sheet.

7.2 Environment

AZDN is manufactured and used in continuous or batch processes within industrial settings. No direct exposure to soil is expected. Potential releases into the environment mainly occur via wastewater.

Based on the risk assessment, environmental exposure can be kept at a safe level when activities are carried out under conditions recommended in the extended Safety Data Sheet (see Chap. 6, and Exposure Scenarios).

Procedures, controls and risk management measures should be implemented on industrial manufacturing and application sites, effluents that may contain the substance must be treated to avoid any exposure to the environment.

8. Risk Management recommendations

Human health measures	
Organizational	Collect the latest available Safety Data Sheet. Implement good basic standards of occupational hygiene. Storage and handling precautions applicable to products: Solid, dust forming, harmful, self reactive substances. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. Provide showers, eye-baths. Provide self-contained breathing apparatus nearby. Provide fire-blanket nearby. Provide water supplies near the point of use. Ensure operatives are well informed of the hazards and trained to minimise exposures. In particular, do not store at more than 25°C.
Engineering controls	Prevention of inflammation should be in place. Provide appropriate ventilation at points of dust emission. Ensure that eye- and handwash stations and safety showers are close to workstation locations.
Protection	Eye/Face protection: Safety glasses with side-shields
	Skin protection: Protective suit
	Hand protection: PVC gloves Glove thickness: 0,6 mm Protective gloves complying with EN 374.
	Respiratory protection: Effective dust mask. Recommended Filter type: P2
Environment protective measures	
Do not release into the environment. Do not let product enter drains. Use waste water treatment systems. Do not spread sludge to soil.	

9. Regulatory Information / Classification and Labelling

9.1 Regulatory Information

This substance has notably been registered and assessed under:



- EU Regulation EC 1907/2006 (REACH)
- OECD SIDS (Screening Information Data Set) program

9.2 Classification and labelling

Under GHS, substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the eSDS. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to CLP (EC) 1272/2008, implementation of the GHS in the European Union.

Classification according to European regulation 1272/2008 (Annex VI Table 3.1)

- Self-reactive substances and mixtures: Type C.
- Acute toxicity - Oral: Category 4.
- Acute toxicity - Inhalation: Category 4.
- Chronic aquatic toxicity: Category 3.

Signal word	
Danger	
Pictograms	
– GHS02: Flame	
– GHS07: Exclamation mark	
Hazard statements	
<ul style="list-style-type: none"> – H242: Heating may cause a fire. – H302: Harmful if swallowed. – H332: Harmful if inhaled. – H412: Harmful to aquatic life with long lasting effects. 	
Additional Classification according to Globally Harmonized System (GHS)	
<ul style="list-style-type: none"> – Acute toxicity - Dermal: Category 5. – Eye irritation: Category 2B; mildly irritating to eyes. – Acute aquatic toxicity: Category 2; Toxic to aquatic life. – Not classified for chronic aquatic toxicity* 	

*: self-classification based on actual data overrides CLP harmonized classification in Category 3.

10. Contact Information within Company

For further information on this substance or product safety summary in general, please contact:

- ICCA portal where the GPS Safety Summary is posted:
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

11. Date of Issues / Revision

- Date of issue: 2013/02/10
- Date of revision:

12. Disclaimer

The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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