

2-methylglutaronitrile

Chemical Identity

Brand names	2-methylglutaronitrile, MGN	CAS number	4553-62-2
Chemical name (IUPAC)	2-methylpentanedinitrile	Molecular formula	C ₆ H ₈ N ₂
Synonyms	1,3-dicyanobutane; 2,5-dicyanobutane; diacrylonitrile	Molecular weight	108.14 g/mol

Applications

2-methylpentanedinitrile is a by-product of chemical synthesis, used as intermediate for the synthesis of Green Solvents and amines. It is used only for industrial purpose and handled under Strictly Controlled Conditions in accordance with REACH regulation for transported isolated intermediates.

Safety Assessment, Exposure and Risk Management Recommendations

Physical and Chemical properties

Property	Result
Physical state	Liquid at room temperature
Colour	Colourless to brown
Odour	Strong, unpleasant
Boiling range	ca. 212,7°C
Relative density	0.953 at room temperature
Flash point	Non flammable
Vapour pressure	Low potential for volatility
Water solubility	Readily soluble
Octanol water partition	Low potential for bioaccumulation

Health effect



MGN may be very dangerous for human health by inhalation, dermal and oral routes. Safety measures must be strictly respected for industrial uses, for more details, consult the Safety Data Sheet.

Environmental effect



MGN is readily biodegradable, not persistent and has a low potential for bioaccumulation. No release in the air (low volatility) and in the effluent (process without water) is expected.

Regulatory information

Classification and labelling



Danger

EU regulation (EC) 1272/2008 (CLP)

Acute toxicity	Oral, Cat. 3	H301 Toxic if swallowed
	Dermal, Cat. 3	H311 Toxic in contact with skin
	Inhalation, Cat. 2	H330 Fatal if inhaled

Registration and certification

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

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.

2-methylglutaronitrile

General Statement

2-methylglutaronitrile is a by-product of adiponitrile synthesis (intermediate for the synthesis of polyamide).

2-methylglutaronitrile is a colourless liquid, with a strong unpleasant odour, very toxic to human health: it has a fatal effect by inhalation and is toxic by ingestion or by skin contact.

It is used only for industrial purpose and handled under Strictly Controlled Conditions in accordance with REACH regulation for transported isolated intermediates.

Chemical Identity

Name: 2-methylglutaronitrile

Brand names: 2-methylglutaronitrile, MGN

Chemical name (IUPAC): 2- methylglutaronitrile

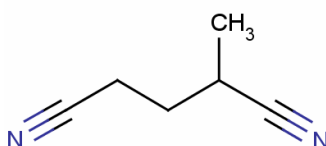
Synonyms: MGN ; 2-methylpentanedinitrile ; 1,3-dicyanobutane ; 2,4-dicyanobutane ; 2-methyl-1,5-valerodinitrile ; diacrylonitrile

CAS number(s): 4553-62-2

EC number: 224-923-5

Molecular formula: C₆H₈N₂

Structure:



Uses and applications

2-methylglutaronitrile is used as an intermediate for the synthesis of Green Solvents and amines.
2-methylglutaronitrile is only used for industrial purpose.

Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Physical state	Liquid at 20°C and atmospheric pressure
Colour	Colourless to brown
Odour	Strong, unpleasant
Molecular weight	108.14 g/mol
Relative density	0.9528 at 20°C
Freezing Point	< - 150°C
Boiling Range	ca. 212.7 °C
Flash point	132°C (closed cup) at atmospheric pressure, not flammable
Explosive properties	Non explosive
Self-ignition temperature	490°C at atmospheric pressure
Vapour pressure	1.9 Pa at 20°C, low volatility
Water solubility	52.3 g/l at 20°C, readily soluble in water
Octanol Water partition coefficient (log Kow)	0.46 (+/- 0.29) (calculated) low potential for bioaccumulation

Based on available data, 2-methylglutaronitrile is not classified regarding physical and chemical hazards, according to EU regulation (EC) 1272/2008.

Health Effects

Human Health Safety Assessment

Effect Assessment	Result
Acute Toxicity Oral /inhalation /dermal	Toxic if swallowed or in contact with skin Fatal if inhaled
Irritation / corrosion Skin/eye/respiratory tract	Not classified as irritating to skin and respiratory tract Slightly irritating to eyes not resulting in classification
Sensitisation	Not classified for skin sensitisation
Toxicity after repeated exposure Oral /inhalation /dermal	Not classified for toxicity after repeated exposure whatever the route of exposure
Genotoxicity / Mutagenicity	Not mutagenic in bacteria
Carcinogenicity	No data needed regarding regulation
Toxicity for reproduction	No data needed regarding regulation

All these results are based on available data and the classification is in accordance with EU regulation (EC) 1272/2008.

Environmental Effects

Environment Safety Assessment

Effect Assessment	Result
Aquatic Toxicity	Not harmful to aquatic organisms

Fate and behaviour	Result
Biodegradation	Not readily biodegradable
Bioaccumulation potential	Not potentially bioaccumulative (Log Kow = 0.46)
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB

Based on available data, 2-methylglutaronitrile is not classified as dangerous for the environment, according to EU regulation (EC) 1272/2008.

Exposure

2-methylglutaronitrile is manufactured and handled under Strictly Controlled Conditions in accordance with REACH regulation for intermediates.

Human health

2-methylglutaronitrile is manufactured in a closed, continuous and automated process which minimizes the workers' exposure potential.

However when workers have a risk of exposure, during (un)loading, sampling, analysis or maintenance operations, the exposure is kept at a safe level (strictly below exposure limits, when applied) by following appropriate risk management measures adapted to the workplace as suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.

Environment

Based on its physical and chemical properties, if 2-methylglutaronitrile was released in the environment, it would be distributed mainly in the water and poorly in the soil and the air.

During industrial manufacture, there is no use of water (except for cooling), so no release to the aqueous effluent network is expected.

Emissions in the air are considered as negligible according to the low vapour pressure.

Risk Management Recommendations

2-methylglutaronitrile is manufactured and handled under Strictly Controlled Conditions (in accordance with the REACH regulation for intermediates) to control the risk of exposure and preserve human health and environment.

Human health

For industrial uses of 2-methylglutaronitrile substance 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).

In order to control possible risks during handling of the substance (during (un)loading, sampling, analysis or maintenance operations), handling must be under adequate ventilation with an effective exhaust ventilation system. Contact with the skin and the eyes must be avoided, appropriate personal protective equipment must be worn as recommended in the SDS (tightly fitting safety goggles, appropriate gloves, self-contained breathing apparatus, boots, appropriate suit, face and neck protection if risk of splashing). Hygiene measures must be respected (accessible emergency equipment, well-maintained PPE, wash hands and skin following contact, do not eat, drink or smoke on the workplace).

Environment

Any release to the aqueous effluent sewer must be avoided.
Emissions in the air are considered as negligible.

State Agency Review

2-methylglutaronitrile has been registered under EU regulation (EC) 1907/2006 (REACH)

Regulatory Information / Classification and Labelling

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

Classification

Acute toxicity, Inhalation, Category 2
Acute toxicity, Oral, Category 3
Acute toxicity, Dermal, Category 3

H330 Fatal if inhaled
H301 Toxic if swallowed
H311 Toxic in contact with skin

Labelling

Pictogram :



Signal word :

Danger

Hazard statements :

H330 Fatal if inhaled
H301 Toxic if swallowed
H311 Toxic in contact with skin

Precautionary statements :

P271 Use only outdoors or in a well-ventilated area
P280 Wear protective gloves/protective clothing/eye protection/face protection
P284 Wear respiratory protection
P303+361+353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P312 Call a POISON CENTER or doctor/physician if you feel unwell

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.