METHACRYLATE PRODUCERS ASSOCIATION, INC.

GLOBAL PRODUCT SUMMARY: METHACRYLIC ACID

(Last Updated: 10/13/13)

Disclaimer

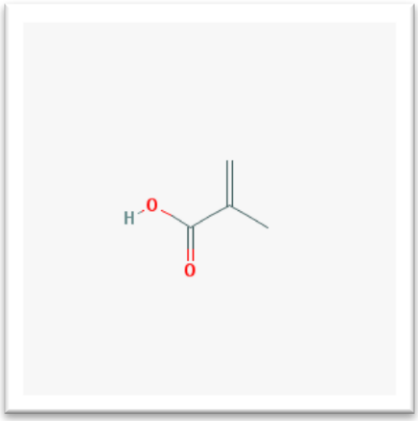
SUBSTANCE NAME

Methacrylic Acid

GENERAL STATEMENT

Undiluted or glacial methacrylic acid [MAA] is produced for use as a building block to make a wide range of polymer-based products that we see and use every day like binders in paints and coatings but also water-soluble polymers, as an interlevant in glass and, as an intermediate for the manufacture of methacrylic acid esters to name but a few. MAA is of low concern to human health and the environment. It is classified as hazardous (irritating to corrosive upon contact depending upon the concentration) but has been handled safely by industry and professionals for over 60 years. MAA-based polymers are inert in the environment and can be recycled back to monomeric MAA.

CHEMICAL IDENTITY



Name: Methacrylic Acid
Chemical name (IUPAC): 2-Methyl-propenoic acid
Synonym: Methacrylic acid
CAS number(s): 79-41-4
Molecular formula: $C^4H^6O^2$

USES AND APPLICATIONS

MAA is produced for use as monomer for production of polymers and as a reactant for synthesis of other methacrylate esters. The substance is manufactured in industrial settings in closed systems and used by industry for manufacture of polymers in closed and semi-closed systems. Downstream use of MAA is almost exclusively in the form of polymer. Consumer exposure is unlikely.

PHYSICAL/CHEMICAL PROPERTIES

The following table includes information which refers to testing performed with the concentrated substance. It is not intended to be comprehensive or to replace information found in the Safety Data Sheet (SDS). A SDS may be obtained from one of the manufacturers.

Property	Value
Physical state	Liquid
Color	Colorless
Odor	Pungent
Density	1.0141 g/cm^3 at °C
Melting/Freezing point	15.4-15.5 °C
Boiling Point	162 °C
Flammability	Highly flammable
Explosive properties	Not explosive
Self-ignition temperature	400 °C
Vapor Pressure	0.97 hPA at 20 °C
Molecular Weight	86.08
Water solubility	98 g/l at 20 °C
Flash point	67 °C
Octanol-water partition coefficient (LogKow)	0.93 at 22 °C

HUMAN HEALTH SAFETY ASSESSMENT

Information for the general population and consumers handling products made with methacrylic acid.

Consumer
Consumer exposure is unlikely due to extremely low levels of residual monomer in polymers used in consumer products (used as monomer in polymerization). Consumer use of concentrated methacrylic acid is not recommended since the material is corrosive and skin contact is to be avoided. See table below for more information.

Worker
Workers may come into contact with MAA during manufacture and during production of polymer products. Workers should follow the recommended safety measures as provided by the manufacturer in the Safety Data Sheet. Direct contact with MAA could produce skin or eye corrosion or irritation depending upon the concentration of MAA, and repeated contact with less concentrated solutions could lead to skin irritation (dermatitis). Inhalation of high levels of vapours may irritate the respiratory system.

The following table includes information for someone handling the concentrated substance. The data, while verifiable, are not intended to be comprehensive nor replace the information found in the SDS.

Effect Assessment	Result
Acute Toxicity	MAA causes severe adverse local effects at the site of application, depending on the concentration and frequency or time of exposure. Undiluted MAA may have moderate to high toxicity after oral, dermal and inhalation exposure
Irritation	Causes irritation/corrosion to the skin, eyes and respiratory system.
Sensitisation	Not sensitizing by skin contact. Does not cause asthma. Click here for a technical summary.
Mutagenicity	Not mutagenic. Click here for a technical summary. No evidence of carcinogenicity. Click here for a technical summary.
Toxicity after repeated exposure	By inhalation MAA causes damage to mucous membranes of the nose and respiratory tract. Other effects in the body are non-specific.
Toxicity for reproduction	Does not selectively harm reproduction or cause birth defects. Click here for a technical summary.

ENVIRONMENTAL SAFETY ASSESSMENT

Based on available data, MAA is of moderate to high toxicity to aquatic organisms. MAA is fully and rapidly biodegradable and while MAA is not intentionally released during manufacturing processes and use, MAA released to air or trace amounts present in waste water streams would rapidly disappear by chemical and biological degradation. MAA does not possess a significant ozone depletion potential and trace emissions will not contribute significantly to global warming.

The following tables include information for testing performed with the concentrated substance. Additional information may be obtained from the SDS supplied by the manufacturer.

Effect Assessment	Result
Aquatic Toxicity	Moderately to highly toxic to aquatic organisms on an acute basis.

Fate and behaviour	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not bioaccumulative
PBT / vPvB conclusion*	Not considered to be either PBT nor vPvB
Environmental impact	Unlikely to persist in, or have significant impact on the environment. Click here for a technical summary.

* Persistent/Bioaccumulative/Toxic (PBT) very Persistent-very Bioaccumulative (vPvB)

EXPOSURE

Consumer

Consumer exposure to liquid monomer is unlikely due to the extremely low levels of residual monomer in polymers used in consumer products (MAA is used as monomer in polymerization). Use of MAA in artificial nail products and other non-medical/dental applications involving direct skin/nail contact with the liquid monomer is not recommended.

Worker

MAA is produced in essentially closed systems so significant worker exposure during manufacture is unlikely. Workers may come into contact with MAA during polymer production.

RISK MANAGEMENT RECOMMENDATIONS

Consumer

Consumer use of products containing MAA-based polymers does not require any risk management measures relating to the MAA residues in those polymers. Use of MAA in artificial nail products and other non-medical/dental applications involving direct skin/nail contact with the liquid monomer is not recommended.

Worker

Workers should follow the recommended safety measures as provided by the manufacturer in the Safety Data Sheet. Considering MAA skin, eye irritating/corrosion as well as respiratory tract irritation properties, risk management measures typically will include avoiding skin contact or the wearing of suitable protective gloves and protective eyewear and avoiding inhalation of high concentrations of vapor by use of one or more of the following: engineering controls, good general ventilation or personal protective (respiratory) equipment, depending upon the particular use conditions. Releases to air and water during manufacturing processes and use would rapidly disappear by environmental degradation processes.

REGULATORY INFORMATION / CLASSIFICATION AND LABELLING

This substance is subject to a number of federal and international statutes and regulations. Selected U.S. regulatory information is available on the MPA website. Other federal, state and local regulations may apply.

This substance has been registered under EU chemical control law known as REACH (Registration, Evaluation, Authorisation and Restriction of Chemical substances), and is listed on various chemical inventories. It has been reviewed under the OECD SIDS (Screening Information Data Set) program.

While the toxicological data are not specific to a particular region, the regulatory frameworks differ between countries and regions. The Global Harmonized System (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. Under the GHS, substances are classified according to their physical, health, and environmental hazards.

Note: The hazard statements and symbols presented here refer to the hazard properties of the concentrated substance and are meant to provide a brief overview of the labelling for the substance. It is not intended to be comprehensive or to replace information found in the SDS.

Classifications:

- Flammable liquid: Category 4
- STOT single exposure: Category 3a
- Eye Irritation: Category 1 (>=3.0-<10.0); Category 2a (>=1.0-<3.0)
- Skin Irritation: Category 2 (>=1.0-<10.0); Category 1a (>=10.0)
- Aquatic acute: Category 3

Labelling

Signal word: Danger

Hazard pictogram:

GHS06: acute toxicity

GHS05: corrosion

Hazard statements:

H227: Combustible liquid
H302: Harmful if swallowed
H311: Toxic in contact with skin.
H332: Harmful if inhaled.
H314: Causes severe skin burns and eye damage.
H335: May cause respiratory irritation.
H402: Harmful to aquatic life

ADDITIONAL INFORMATION

Information on registered substance (ECHA)

http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances

EU Risk Assessment

http://esis.jrc.ec.europa.eu/doc/risk_assessment/REPORT/methacrylicacidreport033.pdf

OECD SIDS

http://webnet.oecd.org/hpv/UI/handler.axd?id=eb63e8f5-522c-48ee-9c98-ba16cd088a29

CONTACT

For further information on this substance or product safety summaries in general, please contact MPA. Click on the logos below to go to the company's website.

Glossary

Acute toxicity - harmful effects after a single exposure
Bioaccumulation - accumulation of substance in an organism
Biodegradation- chemical breakdown of substances by a physiological environment
Carcinogenicity - effects causing cancer
Chronic toxicity - harmful effects after repeated exposures
Clastogen - a substance that causes breaks in chromosomes
Concentrated - Non-formulated undiluted substance
EC – European Commission
ECHA – European Chemicals Agency
Embryotoxicity - harmful effects on fetal health
eSDS -Extended Safety Data Sheet
EU - European Union
GHS - Global Harmonized System
Hazard - situation bearing a threat to health and environment
HPV - High Production Volume
ICCA - International Council of Chemical Associations
IUPAC – International Union of Pure & Applied Chemistry
LogKow - Log Octanol-Water Partitioning Coefficient
Mutagenicity - effects that change genes
PBT/ vPvB - Persistent, Bioaccumulative and Toxic/Very Persistent and Very Bioaccumulative
OECD-Organisation for Economic co-operation and Development
REACH - Registration, Evaluation, Authorisation and Restriction of Chemical substances
Reprotoxicity - combining teratogenicity, embryotoxicity and harmful effects on fertility
SDS - Safety Data Sheet
Sensitizing - causes allergies
SIDS - Screening Inventory Data set
STOT – Specific Target Organ Toxicity
Teratogenic - effects on fetal morphology

Disclaimer

This document is not intended to be comprehensive. It is provided solely as background information and should not substitute for an up-to-date Safety Data Sheet or research should specific regulatory or other legal questions arise. It is not intended to be a statement of legal requirements when using or handling acrylates. Although the information is believed to be accurate as of the last update, new information may become available and regulations frequently change, and no warranty, expressed or implied, is made concerning the contents. In addition, many states and localities adopt their own regulations, which are not covered by this summary or on the MPA website. In all events, the user should consult applicable laws and regulations, as well as their supplier's Safety Data Sheet, for current information and requirements. **NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN.**