BASIC ACRYLIC MONOMER MANUFACTURERS, INC.

GLOBAL PRODUCT SUMMARY: ACRYLIC ACID

(Last Updated: 8/5/14)

Disclaimer

SUBSTANCE NAME

Acrylic Acid

GENERAL STATEMENT

Acrylic Acid (AA) is used in the manufacture of chemicals and chemical products, primarily acrylate esters, acrylate salts, and polymers for use in a variety of products including paints and coatings, adhesives, and treatments for leather and textiles.

CHEMICAL IDENTITY

Name: Acrylic Acid
Chemical name (IUPAC): Prop-2-enoic acid
Synonym: Acrylic Acid
CAS number(s): 79-10-7
Molecular formula: C3H4O2

Structure:

USES AND APPLICATIONS

Acrylic acid is used in the production of esters, polymers and specialty products. It can spontaneously polymerize evolving heat and pressure. Therefore it is usually supplied with an inhibitor to prevent unintended reactions. The chemicals produced using AA, are primarily used as reactive building blocks to produce polymers, coatings and inks, adhesives, sealants, textiles, plastics and elastomers. Specifically, AA is used in the following applications:

- **Chemical intermediates:** for a variety of chemical products
- **Coatings:** as a building block in the synthesis of polymers that are used in latex coatings, floor polishes, lacquers, sealers, textile sizing, textile and leather finishing products
- **Polymerization and formulation:** as a building block in the manufacture of thermoplastics, the production of resins, rubbers, sealants, and also to produce superabsorbent polymers for use in personal care products and soil conditioning

Acrylic acid is not sold for direct consumer use, but it is used as a raw material to make a variety of goods used by consumers or construction personnel and could be present in trace amounts as residual monomer in consumer products.

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 Date Sheet (SDS). A Safety Data Sheet may be obtained from one of the manufacturers

Property	Value
Physical state	Liquid
Color	Colorless
Odor	Acrid, pungent
Density	1.051 g/mL @ 20°C
Melting / boiling point	13°C / 141°C @ 1013 hPa
Flammability	Not flammable The substance has no pyrophoric properties and does not liberate flammable gases on contact with water.
Explosive properties	Non explosive
Self-ignition temperature	438° C at 1013 hPa
Vapor pressure	5.29 hPa@ 25° C
Molecular weight	72.06
Water solubility	1000 g/l at 25° C
Flash point	48.5 °C at 1013 hPa
Octanol-water partition coefficient (Log Pow)	0.46 @ 25°C; pH >1

HUMAN HEALTH SAFETY ASSESSMENT

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

Acrylic acid has a very strong, unpleasant odor that may be bothersome. However, the smell of AA does not necessarily indicate a health hazard. It has a low odor threshold which serves as a good warning property.

Like any reactive chemical, AA can create hazards if not handled properly. The main hazard is irritation. It causes severe burns to skin, eyes and the respiratory tract. It has a low toxicity (lethality) if it is swallowed, inhaled or applied to the skin. Animal studies have not indicated that it causes cancer or reproductive toxicity.

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 Oral / inhalation / dermal	Based on animal studies, AA is considered harmful if swallowed or inhaled. Swallowing of concentrated solutions can result in severe gastrointestinal irritation or ulceration and burns of the mouth and throat. Concentrations that are not corrosive are of low toxicity. Vapor concentrations attainable at room temperature are not immediately hazardous; however, exposures of an hour or more can lead to injury or death.
Irritation / corrosion Skin / eye/ respiratory tract	Causes severe skin irritation with local redness, swelling and chemical burns and destruction of tissues. Liquid can cause severe irritation and serious damage to eyes, even blindness. Vapor or mists are severely irritating to the respiratory tract.
Sensitization	Does not cause an allergic skin reaction.
Toxicity after repeated exposure Oral / inhalation / dermal	Does not cause toxicity to internal organs after repeated exposure in animal studies. The predominant effect is local irritation. The degree of irritation depends on the concentration of the product and the duration of exposure.
Genotoxicity / Mutagenicity	Based on the available test data, not expected to cause genetic effects.
Carcinogenicity	Did not cause tumors in long term animal studies.
Toxicity for reproduction	Did not cause birth defects or adverse reproductive effects or damage to reproductive organs in laboratory animals.

ENVIRONMENTAL SAFETY ASSESSMENT

Acrylic acid is a liquid which is unlikely to persist in the environment. In surface water, sewage treatment plants and soil, rapid degradation is expected. It is not expected to bind extensively to soil or sediment. If released to air, it will undergo degradation within days. It is not expected to accumulate in the food chain, i.e., the bioconcentration potential is low. It biodegrades rapidly in the environment. AA is very toxic to aquatic life. AA is toxic to aquatic life with long lasting effects (fish, algae, invertebrates).

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	Very toxic to aquatic life Toxic to aquatic life with long lasting effects

Fate and Behavior	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB* conclusion	Not considered to be either PBT nor vPvB

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

EXPOSURE

Human health

Acrylic acid is used in the production of industrial and consumer products. Based on these uses, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in an AA manufacturing facility or in the various industrial or manufacturing facilities that use it. It is produced, distributed, stored and consumed in closed systems. Those working with AA in manufacturing operations could be exposed during maintenance, sampling, testing, manual transfer, or other procedures.

- **Consumer exposure to products containing acrylic acid** – AA is not sold for direct consumer use, but it is used as a raw material to make a variety of goods used by consumers or construction personnel and could be present in trace amounts as residual monomer in consumer products, including paints.

Environment

Potential releases into the environment are limited and for the most part occur only during production and processing, typically via wastewater and exhaust gases. If accidentally released to surface water, it rapidly biodegrades and will not persist in the environment and will not accumulate in the food chain.

RISK MANAGEMENT RECOMMENDATIONS

Industrial Manufacturing and Processing

In industrial manufacturing and processing applications, it is always important to obtain a current Safety Data Sheet from your supplier, follow the guidance provided and comply with applicable regulations.

Acrylic acids, acrylates and products containing them should always be handled in well ventilated areas. Each manufacturing facility should have a thorough training program for employees, appropriate work processes, and safety equipment in place to limit unnecessary exposure.

In the event of a spill, the focus is on containing the spill to prevent contamination of soil, ditches, sewers, or surface or ground water. Only trained and properly protected personnel should be involved in clean-up operations.

Professional Applications

Before using any chemical product, the user should be properly trained in safe handling procedures for that product. This means that they should always contact the supplier of the product being used to obtain the most current safe handling advice and follow all instructions and warnings.

Consumer Applications

It is important to read and follow all warnings and instructions on the product label or packaging.

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 BAMM 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 substance's labelling. It is not intended to be comprehensive or to replace information found in the SDS.

Signal word: Danger

Hazard pictogram:

GHS02: flame

GHS07: exclamation mark

GHS05: corrosion

GHS09: environment

Hazard statements:

H226: Flammable liquid and vapour.
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H314: Causes severe skin burns and eye damage.
H332: Harmful if inhaled.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

ADDITIONAL INFORMATION

Information on registered substance (ECHA)
http://echa.europa.eu/web/guest/information-on-chemicals/registered-substances

EU Risk Assessment
http://publications.jrc.ec.europa.eu/repository/handle/111111111/5193

IFA GESTIS-database on hazardous substances
http://www.dguv.de/ifa/en/gestis/stoffdb/index.jsp

International Chemical Safety Card
http://www.cdc.gov/niosh/ipcsneng/neng0688.html

OECD SIDS
http://webnet.oecd.org/hpv/ui/SIDS_Details.aspx?id=df28d13c-0422-4490-8c6e-dda8d1d16425

CONTACT

For further information on this substance or product safety summaries in general, please contact BAMM. Click on a logo 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
Embryotoxicity - harmful effects on fetal health
EU - European Union
eSDS -Extended Safety Data Sheet
GHS -Global Harmonized System
Hazard - situation bearing a threat to health and environment
HPV-High Production Volume
ICCA-International Council of Chemical Associations
Mutagenicity - effects that change genes
OECD-Organisation for Economic co-operation and Development
Concentrated - Non-formulated undiluted substance
REACH-Registration, Evaluation, Authorisation and Restriction of Chemical substances
Reprotoxicity - combining teratogenicity, embryotoxicity and harmful effects on fertility
SIDS - Screening Inventory Data set
SDS-Safety Data Sheet
Sensitizing - causes allergies
Teratogenic - effects on fetal morphology
PBT / vPvB-Persistent, Bioaccumulative and Toxic/ Very Persistent and Very Bioaccumulative

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 BAMM 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.**