BASIC ACRYLIC MONOMER MANUFACTURERS, INC.

GLOBAL PRODUCT SUMMARY: N-BUTYL ACRYLATE

(Last Updated: 8/5/14)

Disclaimer

SUBSTANCE NAME

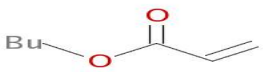
n-Butyl acrylate

GENERAL STATEMENT

Butyl acrylate (nBA) is a colorless volatile liquid with an acrid odor. It is used in the production of coatings, elastomers, adhesives, thickeners, surfactants, fibers, plastics, textiles and inks.

CHEMICAL IDENTITY

Name: n-Butyl acrylate
Chemical name (IUPAC): butyl acrylate
Synonym: 2-Propenoic acid, butyl ester
CAS number(s): 141-32-2
Molecular formula: C7H12O2



Structure:

USES AND APPLICATIONS

Acrylate esters, the family of chemicals to which nBA belongs, are used primarily as reactive building blocks to produce coatings and inks, adhesives, sealants, textiles, and plastics. The acrylate esters typically are present only in trace amounts (as residual monomer) in the finished product. Specifically, nBA is used in the following applications:

- **Adhesives:** for use in construction and pressure-sensitive adhesives as a co-monomer
- **Chemical intermediates:** for a variety of chemical products
- **Coatings:** monomers used to produce polymers for architectural, decorative, industrial, paper and roof coatings
- **Leather:** to produce different polymer finishes, particularly nubuck and suede
- **Plastics:** for the manufacture of a variety of plastics
- **Fibers:** in the manufacture of fibers of both woven and non-woven textiles as a copolymer of e.g. acrylonitrile and nBA. The fibers are in turn used for e.g. the manufacture of textiles.

n-Butyl acrylate is not sold for direct consumer use, but is used as a raw material to make a variety of goods used by consumers or construction personnel, including those listed above. nBA can be present in trace amounts as residual monomer in consumer products, including paints.

PHYSICAL/CHEMICAL PROPERTIES

Butyl acrylate is a colorless volatile liquid (evaporates easily) with a pungent odor.

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 (at room temperature)
Color	Colorless
Odor	Acrid
Density	0.9 g/cm³ @ 20°C
Melting / boiling point	-64.6°C / 147 °C @ atmospheric pressure
Flammability	Flammable upon ignition. The substance has no pyrophoric properties and does not liberate flammable gases on contact with water.
Explosive properties	Non explosive
Self-ignition temperature	292 °C at 1013 hPa
Vapor pressure	5 hPa @ 22.5°C
Molecular weight	128.169
Water solubility	1.7 g/L @ 20°C
Flash point	37 °C @atmospheric pressure
Octanol-water partition coefficient (Log Pow)	2.38 @ 25°C

HUMAN HEALTH SAFETY ASSESSMENT

Information for the general population and consumers handling products made with butyl acrylate.

Acrylate esters, including butyl acrylate, have a very strong, unpleasant odor that may be bothersome. However, the smell of acrylates does not necessarily indicate a health hazard.

Like any reactive chemical, butyl acrylate can create hazards if not handled properly. The primary hazards with butyl acrylate are from contact of the skin or inhalation of its vapors, both being moderately toxic. nBA causes irritation to skin, eyes and the respiratory tract. Repeated skin contact may cause allergic reactions. Butyl acrylate has a low toxicity if swallowed. Animal studies have not indicated that butyl acrylate 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	Moderately toxic after inhalation. Moderately toxic after skin contact. Of low toxicity if swallowed.
Irritation / corrosion Skin / eye/ respiratory tract	Contact may cause skin irritation. May cause eye irritation. May cause irritation to upper respiratory tract (nose and throat).
Sensitization	May cause an allergic skin reaction.
Toxicity after repeated exposure Oral / inhalation / dermal	After repeated exposure the predominant effect is local irritation. The substance may cause damage to the olfactory epithelium after repeated inhalation.
Genotoxicity / Mutagenicity	Based on the available test data, not expected to cause genetic effects.
Carcinogenicity	Did not cause cancer in long term animal studies.
Toxicity for reproduction	Did not cause birth defects in laboratory animals. No adverse effects were seen in the fetus at doses that were not toxic to the mother. Similar materials did not cause reproductive effects in laboratory animals. In addition, no effects were seen on reproductive organs in long-term animal studies.

ENVIRONMENTAL SAFETY ASSESSMENT

In contact with water, nBA will hydrolyze very slowly; also photodegradation in air will proceed slowly. In water, sewage treatment plants and soil rapid degradation is expected, since nBA was readily biodegradable in an OECD 310 -Screening test. Based on an experimental log Pow and calculated BCF, there is no indication of bioaccumulation potential. Adsorption of nBA to the solid soil phase is not expected. nBA is placed into a medium to high mobility class for adsorption and desorption to soils.

Acute toxicity data in freshwater organisms are available for all three trophic levels (fish, aquatic invertebrates and algae). Effect values were all in the same range of concentrations, i.e. between 1 and 10 mg/L, indicating a toxic effect to aquatic organisms.

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

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic organisms. Harmful 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

Butyl acrylate is used in the production of industrial and consumer products.

- **Workplace exposure** – Exposure can occur either in a butyl acrylate manufacturing facility or in the various industrial or manufacturing facilities that use butyl acrylate. It is produced, distributed, stored and reacted in closed systems. Those working with butyl acrylate in manufacturing operations could be exposed during maintenance, sampling, testing, manual transfer, or other procedures. Workplace exposure is controlled by the use of proper industrial handling procedures and safety equipment.

- **Consumer exposure to products containing butyl acrylate** – Butyl acrylate 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 (SDS) from your supplier, follow the guidance provided and comply with applicable regulations.

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

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

Hazard statements:
H226: Flammable liquid and vapour.
H303: May be harmful if swallowed.
H313: May be harmful in contact with skin.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.
H401: Toxic to aquatic life.
H412: Harmful to aquatic life with long lasting effects.

ADDITIONAL INFORMATION

Information on registered substance (ECHA)
http://apps.echa.europa.eu/registered/registered-sub.aspx

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

International Chemical Safety Card
http://www.inchem.org/documents/icsc/icsc/eics0400.htm

OECD SIDS
http://webnet.oecd.org/Hpv/UI/SIDS_Details.aspx?id=d1aec72c-bac3-4b4c-ae6c-ed08b0fe2299

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.**