

Product Safety Summary

iso-Butyl Acrylate

This Product Safety Summary is intended to provide a general overview of the chemical substance. 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 Material Safety Data Sheet (MSDS) for the chemical substance.

Chemical Identity

Abbreviation :	none used
CAS Number :	106-63-8
Formula:	$\text{CH}_2=\text{CHCOOCH}_2\text{CH}(\text{CH}_3)_2$
Common Names:	iso-butyl acrylate 2-Propenoic acid, isobutyl ester 2-propenoic acid 2-methylpropyl ester Acrylic acid, isobutyl ester

Product Overview

- Iso-Butyl Acrylate is a highly reactive material and will readily polymerize if not properly controlled by inhibitors.
- Iso-Butyl Acrylate is an important chemical building block in a wide variety of polymers, used in coatings, paints, adhesives, plastics, textiles and many other applications.
- Like any reactive chemicals, iso-Butyl Acrylate products can create hazards if handled carelessly. All persons associated with the transportation, storage or handling of iso-Butyl Acrylate must understand the hazards. This includes training in the recommended normal and emergency handling procedures.
- The primary hazards with iso-Butyl Acrylate are from contact of the skin, or eyes and the inhalation of its vapors. Occupational Health and Safety Administration (OSHA) has not established an exposure limit. In animal studies, the irritation caused by repeated exposure to vapor from similar products vapor has resulted in nasal lesions. Iso-Butyl Acrylate may cause skin sensitization or allergic reactions. Animal exposure studies have not indicated that iso-Butyl Acrylate poses a cancer hazard.
- For further safety and health information, the current Material Safety Data Sheet (MSDS) should be used for this substance.

Physical/Chemical Properties

- Iso-Butyl Acrylate is a clear, colorless and corrosive and flammable liquid that has an ester like odor.
- The specific gravity of iso-Butyl Acrylate is 0.9 which is less dense than water. Iso-Butyl Acrylate has a low solubility in water at 1.8 grams per liter but is freely soluble in most organic solvents.
- The Flash point of iso-Butyl Acrylate is 30°C, using an open cup test method, with a Lower Flammable Limit of 1.2 volume percent and an Upper Flammable Limit of 8.6 volume percent. It is shipped as a DOT Flammable Liquid. The Boiling point of iso-Butyl Acrylate is 138°C and the Freezing point is -61 °C.
- Iso-Butyl Acrylate will react with itself and a wide variety of chemicals. These reactions can generate heat and the reactions can become progressively more vigorous and can be violent. Iso-Butyl Acrylate can be completely stable when properly inhibited and stored.

Health Information

Acute Hazards

Iso-Butyl Acrylate is a potentially hazardous material. A thorough knowledge of potential dangers, with strict adherence to recommended safety practices, is essential before iso-Butyl Acrylate products are handled, stored or used. Workers must be properly instructed and supervised in the handling of iso-Butyl Acrylate. The primary hazards with iso-Butyl Acrylate are flammability, reactivity, skin contact and the inhalation of its vapors. Iso-Butyl Acrylate has low toxicity after single ingestion, moderate toxicity after short term inhalation but pronounced toxicity after short term skin contact.

Effects on Respiratory System:

Exposure to mists or vapor can produce eye, nose, or lung irritation. Seriousness of irritation depends on the degree of exposure.

Effects on Eyes:

There is data indicate that iso-Butyl Acrylate is not an eye irritant, however, if iso-Butyl Acrylate gets in the eyes, immediately wash eyes for at least 15 minutes under running water with eyelids open and consult an eye specialist.

Effects on Skin:

Iso-Butyl Acrylate is irritating to skin contact and can result in and blistering or burns. Sensitization may occur resulting in allergic skin reactions in those sensitized individuals.

Effects on Ingestion:

The effects of ingestion include the irritation and burning of the mouth, esophagus and stomach. The harm that occurs will be a result of this irritation and not of any systemic toxicity. Drink 4 to 8 ounces of water and DONOT induce vomiting.

Chronic Hazards

Iso-Butyl Acrylate produces toxic effects mainly at the site of contact: nasal lesions if inhaled, skin lesions upon dermal contact, and gastrointestinal effects if iso-Butyl Acrylate solutions are swallowed. Overall, long-term studies and the studies for genetic and reproductive effects, indicate that iso-Butyl Acrylate does not pose a genotoxic or carcinogenic threat, or cause reproductive or developmental effects.

Environmental Information

Iso-Butyl Acrylate is acutely toxic to aquatic life. Because of its reactivity, iso-Butyl Acrylate is generally not persistent in the environment. It disperses via a combination of mechanisms, including biodegradation, oxidation, and volatilization.

In biochemical elimination studies, iso-Butyl Acrylate has been shown to degrade 80-90% in 28 days in activated sludge.

A variety of federal, state and local regulations govern the release of any material to the land, air or surface waters. Any release or discharge of isoButyl Acrylate must be evaluated in reference to these regulations to determine appropriate response actions and reporting requirements.

Emphasis should be placed on the prevention of all releases through careful design of equipment and sound operating procedures. If iso-Butyl Acrylate is lost from containment through a leak or spill, care should be taken to use the proper personal protective equipment, decontamination procedures and other safety considerations. It is important to remember that spills of iso-Butyl Acrylate and materials contaminated by iso-Butyl Acrylate must be handled as RCRA hazardous wastes.

In the event of accidental spillage of iso-Butyl Acrylate to surface waters or to a municipal water system, contact the local and state pollution control agencies immediately.

Additional Hazard Information

Iso-Butyl Acrylate is stable when stored and handled under recommended conditions. All commercially available iso-Butyl Acrylate is stabilized (inhibited) with hydroquinone monomethyl ether (MEHQ), which prolongs the shelf life. However, this shelf life is reduced exponentially with increasing temperature, so exposure to high temperatures must be avoided.

The polymerization of iso-Butyl Acrylate can be very violent, evolving considerable heat and pressure and ejecting hot vapor and polymer, which may autoignite. An explosion hazard exists due to extremely rapid pressure build up. Several case histories are known in which vessels of basic acrylic monomers have exploded due to violent ("runaway") polymerization when proper procedures were not followed.

The presence of dissolved oxygen is necessary for MEHQ to function effectively. Thus, iso-Butyl Acrylate should never be handled or stored under an oxygen-free atmosphere. A gas mixture containing 5 to 21 vol. % of oxygen at one atmosphere should always be maintained above the monomer to ensure inhibitor effectiveness. In a closed system, this atmosphere must be periodically replenished since dissolved oxygen is gradually consumed in the inhibition process.

Exposure Potential

Consumer products potentially could contain trace levels of iso-Butyl Acrylate as a result of the polymerization process, however consumers are not generally exposed to these compounds in finished products. Although potential for exposure does exist during iso-Butyl Acrylate manufacture, transportation and use, enclosed systems limit the exposure to worker populations and nearby communities. Exposure to the general public may occur in accidental situations. Iso-Butyl Acrylate is not intended for the general use by the general public.

Iso-Butyl Acrylate should only be handled by knowledgeable, well-trained personnel who thoroughly understand the hazards associated with the transportation, storage and use of the chemical. Workplace exposure should be limited by the use of engineering controls. Iso-Butyl Acrylate should be processed within a closed system. Worker exposure can potentially happen from leaks in piping system, during repair or replacement of the piping system or during removal of a sample for quality control purposes.

Regulations involving hazardous chemicals are continually evolving and thus exposure guidelines are reviewed regularly and modified whenever new information dictates a change. It is important that all companies handling iso-Butyl Acrylate are aware of the current legislative requirements.

The guidelines established by OSHA, ACGIH, NIOSH and others, represent current thinking and are believed to be conservative and protective of occupational workers. There is not guarantee of absolute safety.

Risk Management

The potential hazards associated with iso-Butyl Acrylate can be avoided if workers are adequately instructed in supervised on the proper procedures of handling iso-Butyl Acrylate. As with all flammable materials suitable fire detection, alarms and suppression systems must be provided and all local fire protection codes consulted for each location handling iso-Butyl Acrylate.

Personal protective equipment (PPE) should be selected based on the potential for exposure to

particular chemical(s), and the unique properties of that chemical. In general, PPE is not an adequate substitute for appropriate workplace controls (such as ventilation), or other safe work practices. There may be situations when the only practical means of preventing employee exposure is through the effective use of PPE. When PPE is provided to employees, they must be trained in how, where, when, and why the equipment should be used. The facility must also have provisions for decontaminating and replacing such equipment as necessary.

Eye protection in the form of chemical splash goggles should be worn to prevent Butyl Acrylate from accidentally splashing in an employee's eye. Goggles should be non-vented, and designed specifically to protect against chemical splash. If an employee wears corrective lenses, chemical goggles should be worn over the lenses. Contact lenses are not recommended for use in areas where there is a potential for exposure to iso-Butyl Acrylate.

Skin protection may be found in many forms. Hand protection such as chemical resistant gloves, protective arm sleeves, aprons, full body coveralls, boots, and head coverings are among the types available. Skin protection must be made of a material impervious to iso-Butyl Acrylate. Butyl rubber of 0.4 to 0.6 mm thickness is a good example. Neoprene is less resistant but is acceptable. Personal protective equipment should be selected on the basis of potential exposure, e.g., gloves may be required for sample collection while full body clothing including gloves, boot covers, head covering may be necessary for spill clean-up. Skin protection for the purpose of preventing chemical exposure may be worn in conjunction with other types of PPE. For example, steel toe safety shoes may be required to prevent a person's foot from being crushed, but an additional boot cover may be required to prevent iso-Butyl Acrylate permeation into the safety shoe. Skin protection PPE is available in a variety of sizes, and should be available in a size that fits the employee wearing it. Improperly sized PPE may compromise its effectiveness and create additional safety hazards. When skin protection PPE is used, there must be a means of cleaning or disposal/replacement of the PPE.

Respiratory protection is available in two basic varieties, air purifying, and air supplied. In general, air purifying respirators provide less protection than air supplied respirators. Both types, however, have their particular advantages and limitations. The appropriate type of respirator must be selected to provide the appropriate level of protection for the anticipated degree of exposure to airborne iso-Butyl Acrylate (vapor or mist). Detailed guidance for the selection of respiratory protection can be found in The American National Standards Institute Document Z88.2. Respiratory protective equipment should be approved by NIOSH. It must be carefully maintained, inspected, and cleaned. All employees required to wear respiratory protection must be medically cleared to do so (this ensures their physical capability to wear a respirator) and trained to use and care for the equipment. OSHA requirements for respiratory protection can be found in 29 CFR 1910.134.

Properly designed emergency showers and eyewash fountains should be placed in convenient locations wherever iso-Butyl Acrylate is used. All employees should know the location and operation of this equipment. All equipment must be frequently inspected to make sure they are in proper working condition.

Contact Information

<http://www.basf.com>

MSDS

http://worldaccount.basf.com/wa/PublicMSDS-en_US/Search

References

"Acrylate Esters," A Summary of Safety and Handling, ICSHAM, 3rd Edition.

"Acrylate Esters: Background Information", Basic Acrylic Monomer Manufacturers, Inc.(BAMM)website, April 2006.

"Heath Effect Assessments of the Basic Acrylates", Basic Acrylic Monomer Manufacturers, CRC Press, 1993, ISBN 0-8493-4721-1

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