

Product Safety Summary

2-Ethylhexyl 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 :	2-EHA
CAS Number :	103-11-7
Formula:	$\text{CH}_2=\text{CHOOCH}_2\text{CH}(\text{C}_2\text{H}_5)\text{C}_4\text{H}_9$
Common Names:	2-Ethylhexylacrylate 2-Propenoic acid, 2-Ethylhexyl ester Acrylic acid, 2-Ethylhexyl ester

Product Overview

- 2-Ethylhexyl Acrylate is an important chemical building block in a wide variety of polymers, used in coatings, paints, adhesives, plastics, textiles and many other applications.
- 2-Ethylhexyl Acrylate is a highly reactive material and will readily polymerize if not properly controlled by inhibitors.
- Like any reactive chemicals, 2-Ethylhexyl Acrylate can create hazards if handled carelessly. All persons associated with the transportation, storage or handling of 2-Ethylhexyl Acrylate must understand the hazards. This includes training in the recommended normal and emergency handling procedures.
- The primary hazards with 2-Ethylhexyl Acrylate are from contact of the skin and the inhalation of its vapors. Airborne limits have not been established for 2-Ethylhexyl Acrylate vapor concentrations in the work environment. In animal studies, the irritation caused by repeated exposure to acrylate monomer vapor has resulted in nasal lesions. 2-Ethylhexyl Acrylate has been shown to cause skin sensitization or allergic reaction.
- For further safety and health information, the current Material Safety Data Sheet (MSDS) should be used for this substance.

Physical/Chemical Properties

- 2-Ethylhexyl Acrylate is a clear, colorless and corrosive and combustible liquid that has a strong pleasant odor. The odor threshold is less than 200ppb.
- The specific gravity of 2-Ethylhexyl Acrylate is 0.9 and less dense than water. Solubility in water is 0.1grams/liter and is freely soluble in most organic solvents.
- The Flash point, the temperature at which a flame will ignite the vapors, for 2-Ethylhexyl Acrylate is 87°C, using a Tag Closed Cup method. Containers containing over 119gals are regulated by the Department of Transportation as a Combustible Liquid, smaller containers are not regulated.
- The Boiling point of 2-Ethylhexyl Acrylate is 216°C and the Freezing point is less than -76 °C.
- 2-Ethylhexyl 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. However, 2-Ethylhexyl Acrylate can be completely stable when properly inhibited and stored.

Health Information

Acute Hazards

2-Ethylhexyl Acrylate is a potentially hazardous material. A thorough knowledge of potential dangers, with strict adherence to recommended safety practices, is essential before 2-Ethylhexyl Acrylate products are handled, stored or used. Workers must be properly instructed and supervised in the handling of 2-Ethylhexyl Acrylate. The primary hazards with 2-Ethylhexyl Acrylate are reactivity, skin contact and the inhalation of its vapors.

Effects on Respiratory System:

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

Effects on Eyes:

There is data indicate that 2-Ethylhexyl Acrylate is not an eye irritant, however, if 2-Ethylhexyl 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:

2-Ethylhexyl 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

2-Ethylhexyl Acrylate produces toxic effects mainly at the site of contact: nasal lesions if inhaled, skin lesions upon dermal contact, and gastrointestinal effects if 2-Ethylhexyl Acrylate solutions are swallowed. Overall, long-term studies and the studies for genetic and reproductive effects, indicate that 2-Ethylhexyl Acrylate does not pose a genotoxic or carcinogenic threat, or cause reproductive or developmental effects.

Environmental Information

Because of its reactivity, 2-Ethylhexyl Acrylate is generally not persistent in the environment. It disperses via a combination of mechanisms, including biodegradation, oxidation, and volatilization.

In biochemical oxygen demand (BOD) studies, 2-Ethylhexyl Acrylate has been shown to degrade 70-80% in 28 days.

2-Ethylhexyl Acrylate is moderately toxic to aquatic life, but not persistent in aquatic environments, due to rapid oxidation. Large releases can deplete dissolved oxygen.

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 2-Ethylhexyl 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 2-Ethylhexyl 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. 2-Ethylhexyl Acrylate and materials contaminated by 2-Ethylhexyl Acrylate must be disposed of at RCRA licensed facility.

In the event of accidental spillage of 2-Ethylhexyl Acrylate to surface waters or to a municipal water system, contact the local and state pollution control agencies immediately.

Additional Hazard Information

2-Ethylhexyl Acrylate is stable when stored and handled under recommended conditions. All commercially available 2-Ethylhexyl 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 2-Ethylhexyl 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 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, 2-Ethylhexyl 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 2-Ethylhexyl 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 2-Ethylhexyl 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. 2-Ethylhexyl Acrylate is not intended for the general use by the general public.

2-Ethylhexyl Acrylate vapor has an odor that allows for early detection of any potential release. 2-Ethylhexyl 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. 2-Ethylhexyl 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 2-Ethylhexyl 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 2-Ethylhexyl Acrylate can be avoided if workers are adequately instructed in supervised on the proper procedures of handling 2-Ethylhexyl Acrylate. As with all

combustible materials suitable fire detection, alarms and suppression systems must be provided and all local fire protection codes consulted for each location handling 2-Ethylhexyl 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 2-Ethylhexyl 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 acrylic monomers. Corrosive vapors can collect behind contact lenses and may cause severe damage to the eye and/or cause the contact lenses to adhere to the eyes.

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 2-Ethylhexyl Acrylate. Butyl rubber of 0.4 to 0.6 mm thickness is a good example. Neoprene is less resistant to 2-Ethylhexyl Acrylate 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 2-Ethylhexyl 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 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 2-Ethylhexyl 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.

Federal/Science Findings

U.S Department of Labor – Occupational Safety and Health Administration (OSHA)

http://www.osha.gov/dts/chemicalsampling/data/CH_240533.html

American Conference of Governmental Industrial Hygienists (ACGIH)

<http://www.acgih.org>

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.

“Health Effect Assessments of the Basic Acrylates”, Basic Acrylic Monomer Manufacturers, CRC Press, 1993, ISBN 0-8493-4721-1

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