Product Safety Assessment

Hydroxyethyl Acrylate


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**Names**

- CAS No. 818-61-1
- Hydroxyethyl acrylate
- 2-Hydroxyethyl acrylate
- EC No. 212-454-9
- 2-Propenoic acid, 2-hydroxyethyl ester
- ROCRYL™ 420

**Product Overview**

- Hydroxyethyl acrylate is incorporated into polymer coatings and adhesives, radiation-cure resins, emulsion polymers, and as an additive in personal care products and ion exchange resins. See [Product Uses](#).
- Acrylic esters, including hydroxyethyl acrylate, have a distinctive odor that may be bothersome. However, the smell does not necessarily indicate a health risk.¹ Skin or eye contact with hydroxyethyl acrylate liquid or vapor could result in severe injury. Hydroxyethyl acrylate can be absorbed through the skin in potentially harmful amounts and can cause an allergic skin reaction. Vapors can be toxic, and vapor exposure could result in severe irritation to the upper respiratory tract and lungs. Vapor from heated material may cause adverse effects, even death. Hydroxyethyl acrylate may be harmful if swallowed, and can cause burns to mouth and throat and irritation to the gastrointestinal tract. See [Health Information](#).
- Consumer exposure to hydroxyethyl acrylate is unlikely. Those working with hydroxyethyl acrylate in manufacturing operations could be exposed during maintenance, sampling, testing, manual transfer, or other procedures. See [Exposure Potential](#).
- Hydroxyethyl acrylate is a combustible liquid. It is stable under recommended storage conditions. Elevated temperatures can cause decomposition or hazardous polymerization, so hydroxyethyl acrylate has inhibitors added to reduce the probability of polymerization. See [Product Description](#) and [Physical Hazard Information](#).

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**Manufacture of Product**

- **Capacity** ⁵ – Dow is a major producer of hydroxyethyl acrylate with manufacturing facilities located in Texas, in the United States.
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- **Process** – Ethylene oxide is reacted with acrylic acid to produce hydroxyethyl acrylate. The reaction diagram is shown below:

  \[
  \text{Acrylic acid} + \text{Ethylene oxide} \rightarrow \text{Hydroxyethyl acrylate}
  \]

  The pendant —OH group in Hydroxyethyl acrylate is available for further reaction, especially cross-linking reactions.

Product Description

ROC RYL™ 420 Hydroxyethyl acrylate is a clear, colorless liquid with a slight acrylic odor. It is readily miscible with water and most organic solvents. ROC RYL 420 Hydroxyethyl acrylate contains typically 350 to 650 ppm (parts per million) of the monomethyl ether of hydroquinone (MEHQ, CAS 150-76-5) added as an inhibitor to prevent polymerization under recommended storage conditions. ROC RYL 420 Hydroxyethyl acrylate is generally available in purities of greater than 97.5%.

Product Uses

Hydroxyethyl acrylate is primarily used as a reactive building block to produce cross-linkable polymer coatings and adhesives. Hydroxyethyl acrylate is used to manufacture:

- High performance automotive coatings for automotive applications
- Heat-curable automotive clear coats
- Pressure sensitive adhesives
- Coatings for plastics and flexible substrates
- Emulsion polymers
- Additives for personal care products and ion exchange resins
- Resins for radiation-curable coatings

Exposure Potential

Hydroxyethyl acrylate 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 a hydroxyethyl acrylate manufacturing facility or in the various industrial or manufacturing facilities that use hydroxyethyl acrylate. It is produced, distributed, stored and consumed in closed systems. Those working with hydroxyethyl acrylate in manufacturing operations could be exposed during maintenance, sampling, testing, manual transfer, or other procedures. Each manufacturing facility should have a thorough training program for employees, appropriate work processes and safety equipment in place to limit unnecessary hydroxyethyl acrylate exposure. Preferred glove barrier materials include chlorinated polyethylene, polyethylene, ethyl vinyl alcohol laminate (EVAL), polyvinyl alcohol (PVA), or styrene/butadiene rubber. Consult the relevant Safety Data Sheet (SDS) or see Health Information.

- **Consumer exposure to products containing hydroxyethyl acrylate** – Dow does not sell hydroxyethyl acrylate 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. See Health Information.
Environmental releases – 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. Evacuate the area and stay upwind of the spill. Ventilate the area of leaks or spills. Only trained and properly protected personnel should be involved in clean-up operations. Eliminate all sources of ignition in vicinity of the spill or released vapor to avoid fire or explosion. Ground and bond all containers and handling equipment. Use appropriate safety and protective equipment. Absorb with noncombustible material such as dirt, sand, polyethylene or polypropylene fiber products. Do not use clay, cellulose, sawdust, or other, similar absorbants. Consult the relevant SDS for more information about protective equipment and procedures. See Environmental, Health and Physical Hazard Information.

Large release – Industrial spills or releases are infrequent and are generally contained. If a large spill does occur, dike area to contain spill. Contain the spilled material if possible and keep it out of sewers. Ground and bond all containers and handling equipment and avoid all ignition sources. Pump with explosion-proof equipment. If available, use foam to smother or suppress vapors. The material should be captured, collected and reprocessed, or disposed of according to applicable governmental requirements. For emergency and other conditions where the exposure guideline may be exceeded, use an approved positive-pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus (SCBA) or positive pressure air line with auxiliary self-contained air supply. Follow emergency procedures carefully. See Environmental, Health and Physical Hazard Information.

Health Information

Acrylic esters, including hydroxyethyl acrylate, have a distinctive odor that may be bothersome. However, the smell alone does not necessarily indicate a health risk. These esters have an extremely low odor “threshold,” meaning that even very small amounts in the air can be detected by smell.

Hydroxyethyl acrylate liquid may cause severe eye irritation with corneal damage. Injuries may be slow to heal or even permanent. Vapor contact may cause eye irritation with symptoms such as mild discomfort and redness.

Brief skin contact may cause skin irritation with local redness, including an allergic skin reaction. Prolonged skin contact may result in skin burns, including pain, severe local redness, swelling, and tissue damage. Prolonged or widespread contact could result in absorption of amounts that could be fatal.

Excessive exposure to hydroxyethyl acrylate vapors may cause severe irritation to the upper respiratory tract (nose and throat). Vapor from heated material may cause serious adverse effects, even death.

Hydroxyethyl acrylate has low toxicity if swallowed, but swallowing may result in burns of the mouth and throat and gastrointestinal irritation or ulceration. Vomiting should not be induced as it could result in aspiration of material into the lungs.

Hydroxyethyl acrylate does not cause cancer or birth defects in laboratory animals even at doses toxic to the mother.

For specific health information, review the Safety Data Sheet (SDS).
Environmental Information

The bioconcentration potential for hydroxyethyl acrylate is low, and its aerobic biodegradation is high. Hydroxyethyl acrylate is toxic to aquatic organisms. For specific environmental information, review the Safety Data Sheet (SDS).

Physical Hazard Information

Because of its low volatility, hydroxyethyl acrylate is not considered an unusual fire hazard. However, it is combustible and should be kept away from heat, sparks, flame and any sources of ignition.

Fire Fighting Instructions

Should ignition occur, extinguish with water fog or fine spray, dry chemical fire extinguisher, carbon dioxide fire extinguisher, or foam. Do not use direct water stream as it may spread the fire.

- Alcohol-Type Concentrate (ATC) foams (in other words, alcohol-resistant foams) are preferred. General purpose synthetic foams (including aqueous film-forming foams, also called AFFFs) or protein foams may function, but will be less effective.
- Personal protection for fire fighters should include positive-pressure, self-contained breathing apparatus (SCBA) and protective fire-fighting clothing includes fire-fighting helmet, coat, trousers, boots, and gloves.
- Avoid contact with this material during fire-fighting operations. If contact is likely, change to full chemical-resistant fire-fighting clothing with SCBA. If this is not available, wear full chemical-resistant clothing with SCBA and fight fire from a remote location.

Reactivity/Stability

Hydroxyethyl acrylate is stable under recommended storage conditions. Elevated temperatures can cause decomposition or hazardous polymerization. Polymerization can be catalyzed by the absence of air, the presence of free radical initiators and peroxides, acids, UV light, bases, or high temperature.

Hydroxyethyl acrylate contains an inhibitor to minimize polymerization under recommended storage conditions. See Product Description or SDS. Maintain inhibitor and dissolved oxygen level. Uninhibited monomer, liquid and vapor, can polymerize and plug relief devices.

Avoid unintended contact with activated carbon or silica gel, which may cause polymerization. Avoid contact with cellulose- or clay-based absorbants, and with incompatible materials, such as:
- Oxidizing or reducing materials, including peroxides
- Strong acids
- Strong bases
- Metals (iron or steel, especially if rusty) and metal oxides

Additional physical property information for hydroxyethyl acrylate is available on the SDS.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of hydroxyethyl acrylate. These regulations may vary by city, state, country or geographic region. Information may be found by consulting the relevant SDS or Contact Us.
Additional Information

- **Safety Data Sheet**
- **ROCRYL™ 420 Technical Data Sheet**, The Dow Chemical Company
- The Basic Acrylic Monomers Manufacturers’ website (www.bamm.net)

For more business information about hydroxyethyl acrylate, visit Dow’s [Functional Monomers](http://www.dow.com/functionalmonomers/index.htm) website.

References

3. **ROCRYL™ 420 (HEA) Monomer LA, Safety Data Sheet for the US**, The Dow Chemical Company
4. **Hydroxyethyl acrylate, Technical Data Sheet**, The Dow Chemical Company, Form No. 296-01328-1205

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