Product Safety Assessment  
Hydroxypropyl Acrylate


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Names
- CAS No. 25584-83-2
- Hydroxypropyl acrylate
- Propylene glycol acrylate
- EC No. 247-118-0
- 1,2-Propanediol monoacrylate
- ROCRYL™ 430

Product Overview
- Hydroxypropyl acrylate is incorporated into polymer and latex coatings, pressure-sensitive adhesives, radiation-cure resins, and ion exchange resins. See Product Uses.
- Acrylic esters, including hydroxypropyl acrylate, have a distinctive odor that may be bothersome. However, the smell does not necessarily indicate a health risk. Skin or eye contact with hydroxypropyl acrylate liquid or vapor could result in severe injury. Hydroxypropyl 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. Hydroxypropyl 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 hydroxypropyl acrylate is unlikely. Those working with hydroxypropyl acrylate in manufacturing operations could be exposed during maintenance, sampling, testing, manual transfer, or other procedures. See Exposure Potential.
- Hydroxypropyl acrylate is a combustible liquid. It is stable under recommended storage conditions. Elevated temperatures can cause decomposition or hazardous polymerization, so hydroxypropyl 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** – Dow is a major global producer hydroxypropyl acrylate, with manufacturing facilities located in Texas, in the United States.
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- **Process** – Hydroxypropyl acrylate is produced by reacting propylene oxide with acrylic acid. The reaction diagram is shown below:

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\begin{align*}
\text{Acrylic acid} & \quad \text{Propylene oxide} & \quad \text{Hydroxypropyl acrylate} \\
H_2C=CHCOOH & + \quad H_2C=CHCH_3 & \quad H_2C=CHCOOCHCH_2OH \\
\end{align*}
\]

Two isomers of hydroxypropyl acrylate are produced. The lower isomer in the reaction diagram is preferred by a three-to-one ratio (75/25). In both isomers, after a polyacrylate is formed at the double bond, the pendant —OH group is available for further reaction, especially cross-linking (or curing) reactions.

**Product Description**

Hydroxypropyl acrylate is a clear, colorless liquid with a slight acrylic odor. It is readily miscible with water and most organic solvents. Hydroxypropyl acrylate contains typically 350 to 650 ppm (parts per million) of the monomethyl ether of hydroquinone (MEHQ, CAS No. 150-76-5) added as an inhibitor to prevent polymerization under recommended storage conditions. Hydroxypropyl acrylate is generally available in purities of 97.0% or better and may contain as much as 1% residual acrylic acid (CAS 79-10-7) and up to 3% of other similar esters of acrylic acid.

**Product Uses**

Hydroxypropyl acrylate is primarily used as a reactive building block to produce cross-linkable polymer coatings and adhesives. DOW™ hydroxypropyl 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
- Ion exchange resins
- Resins for radiation-curable coatings

**Exposure Potential**

Hydroxypropyl 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 hydroxypropyl acrylate manufacturing facility or in the various industrial or manufacturing facilities that use hydroxypropyl acrylate. It is produced, distributed, stored and consumed in closed systems. Those working with hydroxypropyl acrylate in manufacturing operations could be exposed during maintenance, sampling, testing, manual transfer, or other procedures. Each manufacturing facility should

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have a thorough training program for employees, appropriate work processes and safety equipment in place to limit unnecessary hydroxypropyl 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 hydroxypropyl acrylate** – Dow does not sell hydroxypropyl 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 the 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 Drierite absorbents. 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 hydroxypropyl 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. 

Hydroxypropyl acrylate liquid may cause severe eye irritation with corneal damage, even blindness. 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 harmful.

Excessive exposure to hydroxypropyl acrylate vapors may cause severe irritation to the upper respiratory tract (nose and throat).
Hydroxypropyl acrylate may be harmful if swallowed, and 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.

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

Environmental Information

The bioconcentration potential for hydroxypropyl acrylate is low, and its aerobic biodegradation is high. Hydroxypropyl acrylate may be harmful to aquatic organisms.

For specific environmental information, review the SDS.

Physical Hazard Information

Because of its low volatility, hydroxypropyl 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 (also called 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

Hydroxypropyl 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, bases, UV light, sunlight, or high temperature.

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

Avoid contact with clay-based absorbents and with incompatible materials, such as:
- Oxidizing or reducing materials, including peroxides
- Strong acids
- Strong bases
- Metals (iron or steel (especially if rusty), copper, brass) and metal oxides

Additional physical property information for hydroxypropyl acrylate is available on the SDS.
Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of hydroxypropyl 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

For more business information about hydroxypropyl acrylate, visit Dow’s Functional Monomers web site.

References
1 About Acrylates, Basic Acrylic Monomer Manufacturers, Inc., 2014.
2 ROCRYL™ 430 (HPA) MONOMER LA , Safety Data Sheet, The Dow Chemical Company
3 ROCRYL 430 (HPA) MONOMER: Hydroxypropyl Acrylate for High Performance Coatings, Technical Data Sheet, The Dow Chemical Company, Form No. 296-01329-1205
5 Dow’s Functional Monomers website: Products http://www.dow.com/functionalmonomers/prod/

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