

Product Stewardship Summary

Hydroxybutyl Vinyl Ether

General Statement

Hydroxybutyl vinyl ether is a colorless liquid. It is used in coatings and adhesives used for labels, commercial printing, and flexible packaging industries.

Hydroxybutyl vinyl ether may cause serious eye irritation and harmful if swallowed. Hydroxybutyl vinyl ether may be harmful to aquatic life with long lasting effects.

Hydroxybutyl vinyl ether is combustible and reactive chemical which can be effectively cured using three distinct types of polymerization processes; cationic, charge transfer or free radical.

Chemical Identity

Name: Hydroxybutyl vinyl ether

Brand Names: RAPI-CURE™ HBVE

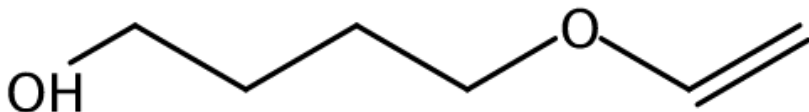
Chemical name (IUPAC): 4-(vinylloxy)butan-1-ol

CAS number: 17832-28-9

EC number: 241-793-5

Molecular formula: C₆H₁₂O₂

Structure:



Uses and Applications

Hydroxybutyl vinyl ether is used in coatings and adhesives used for labels, commercial printing, and flexible packaging industries.

Ashland produces a broad range of UV/EB coatings and adhesives used for labels, commercial printing, and flexible packaging industries. These products offer high aesthetics and superior performance.



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Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Form	Liquid
Physical state	At room temperature: Liquid
Color	Colorless to slight yellow
Odor	Faint odor, ether-like
Density	0.94 g/cm ³ at 20 °C
Melting / Boiling point	Melting point/ melting range: - 33 °C Boiling point/ boiling range: 190 °C
Flammability	Not readily ignited
Autoflammability / Self-ignition temperature	225 °C
Vapor pressure	0.19 mmHg at 25 °C
Molecular weight	116.16 g/mol
Water solubility	8 % at 25 °C
Flash point	88 °C
Octanol-water partition coefficient (LogKow)	0.42 at 25 °C (estimated by calculation)

Health Effects

Human Health Safety Assessment

Consumer: Consumer usage of hydroxybutyl vinyl ether is unlikely as the substance is manufactured and handled in industrial settings in closed systems.

Worker: Workers will not come into contact with hydroxybutyl vinyl ether, as the substance is manufactured and handled in industrial settings in closed systems. In case of accidental or unintended exposure during maintenance, sampling, testing, or other procedures where workers could be exposed to hydroxybutyl vinyl ether, the workers should follow the recommended safety measures in the Safety Data Sheet (SDS).

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Hydroxybutyl vinyl ether is moderately toxic after single ingestion, and is nontoxic after a single skin contact. The inhalation of a highly saturated vapor-air-mixture represents an unlikely acute hazard.
Irritation / corrosion Skin / eye / respiratory test	Hydroxybutyl vinyl ether may cause a moderate/serious eye irritation.
Sensitization	Skin sensitizing effects were not observed in animals studies.
Toxicity after repeated exposure Oral / inhalation / dermal	No adverse effects were observed after repeated oral exposure in animal studies.
Genotoxicity / Mutagenicity	No mutagenic / genotoxicity effect was found in various tests with bacteria and mammalian cell culture.
Carcinogenicity	No data available concerning carcinogenic effects.
Toxicity for reproduction	The results of animal studies gave no indication of reproductive toxicity.

Environmental Effects

Environmental Safety Assessment

Hydroxybutyl vinyl ether may be harmful to aquatic life with long lasting effects, but the potential for bioconcentration in aquatic organisms is low.

Effect Assessment	Result
Aquatic Toxicity	No Observed Effect Concentration (NOEC) at 96 hr was 22 mg/L in <i>Leuciscus idus</i> . Median effective concentration (EC ₅₀) at 48 hr in <i>Daphnia magna</i> was greater than 100 mg/L.
Fate and behavior	
Biodegradation	Hydroxybutyl vinyl ether is considered to be biodegradable based on substances of a similar structure or composition.
Bioaccumulation potential	The accumulation of hydroxybutyl vinyl ether in aquatic organisms is not expected based on octanol-water partition coefficient.
PBT / vPvB conclusion	Not PBT or vPvB.

Exposure

Human Health

Consumers will not come into contact with hydroxybutyl vinyl ether as it is manufactured in closed systems and there are no known consumer uses for hydroxybutyl vinyl ether. Both inhalation and dermal exposures are likely routes of exposure to the workers. Workers in the laboratory or in manufacturing settings may be unintentionally exposed to hydroxybutyl vinyl ether.

Environment

With the exception of large scale spills, environmental concentrations of hydroxybutyl vinyl ether are unlikely to be sufficient to cause ecotoxicity.

Risk Management Recommendations

Workers handling hydroxybutyl vinyl ether should follow the recommended safety measures in the SDS. Transfer and handling of the product should be only done in closed systems or under minimal exposure conditions with appropriate protective equipments.

Respiratory protection must be worn whenever the WEL(Workplace Exposure Limit) levels may be exceeded. Hand protection suitable for handling hydroxybutyl vinyl ether must be worn and observe glove manufacturer's instructions concerning penetrability and breakthrough time. At first sign of deterioration, gloves must be replaced. Tightly sealed safety glasses should be worn and in case of increased risk, face protective shield should be worn.

Do not eat or drink while handling hydroxybutyl vinyl ether, and take off immediately all contaminated clothing. Wash hands before breaks and after work. Safety shower and eye wash station should be easily accessible to the work area.

Regulatory Agency Review

Hydroxybutyl vinyl ether is on the NDSL Canada Gazette, Part I

Hydroxybutyl vinyl ether is on the IECSC Inventory of Existing Chemical Substances in China

Hydroxybutyl vinyl ether is on the EU REACH: List of Registered Substances

Hydroxybutyl vinyl ether is on the EINECS Annex to Official Journal of the European Communities

Hydroxybutyl vinyl ether is on the ENCS Japanese Gazette. Contained within class: Low Molecular Chain-like Organic Compounds.

Hydroxybutyl vinyl ether is on the ECL Korean Existing Chemicals List

Regulatory Information / Classification and Labeling

Under GHS, substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels and the eSDS. 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.

Hazard Statements:

H302: Harmful if swallowed

H319: Causes serious eye irritation.

H412: Harmful to aquatic life with long lasting effects

Signal word: Warning

Precautionary statements:

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P264: Wash with plenty of water and soap thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

P280: Wear protective gloves and eye/face protection.

P370 + P378: In case of fire: Use water spray, dry powder, foam or carbon dioxide for extinction.

P403 + P235: Store in a well-ventilated place. Keep cool.

Hazard pictogram:



Conclusion

Hydroxybutyl vinyl ether is a combustible liquid. Hydroxybutyl vinyl ether must be kept away from heat/sparks/open flames/hot surfaces and stored in a well-ventilated place.

Hydroxybutyl vinyl ether can cause a serious eye irritation. With the exception of large scale spills, environmental concentrations of hydroxybutyl vinyl ether are unlikely to be sufficient to cause ecotoxicity.

Contact Information with Company

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Additional Information

For more information on GHS, visit <http://www.osha.gov/dsg/hazcom/ghsguideoct05.pdf> or http://live.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.

Ashland product stewardship summaries are located at <http://www.ashland.com/stewardship>

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REACH registration is specific to Importers/Manufacturers that place the chemical on the EU market, and specific to registered uses. Inclusion on the list of REACH Registered Substances does not automatically imply registration by Ashland.

Inclusion on the New Zealand Inventory of Chemicals applies only to the pure substance listed. The importer of record must determine whether or not their substances are in compliance.