Product Stewardship Summary

Ethylhexanol-2

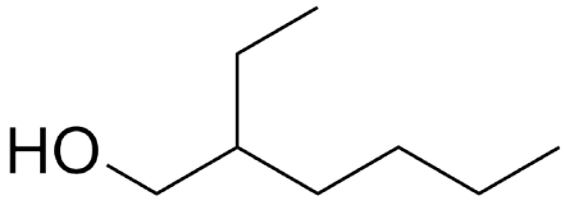
General Statement

Ethylhexanol-2 is a colorless liquid. It is a branched eight-carbon oxo alcohol that has excellent reactivity as a chemical intermediate. Ethylhexanol-2 is a low to moderate hazard material and the risk of adverse health effects associated with both occupational and consumer use of this chemical is anticipated to be low.

Ashland purchases, produces and sells this chemical. Exposure controls in the workplace serve to prevent adverse health effects to workers. Consumer exposure will be limited to low levels present within household product formulations such as washing and cleaning products. When handled responsibly, the potential for hazards can be minimized, allowing consumers and workers to use materials containing ethylhexanol-2 safely.

Chemical Identity

Name: Ethylhexanol-2
Brand Names: Not Applicable
Chemical name (IUPAC): 2-ethylhexan-1-ol
CAS number(s): 104-76-7
EC number: 203-234-3
Molecular formula: $C_8H_{18}O$
Structure:



Uses and Applications

The main uses for ethylhexanol-2 are in the production of plasticizers, coatings, adhesives and other specialty chemicals. Ethylhexanol-2 is used in the formulation of substances and mixtures such as cleaning agents, in oil field drilling and production operations, and as a flavoring additive in some foods.

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Physical/Chemical Properties

Phys/Chem Safety Assessment

Property	Value
Form	Colorless liquid
Physical state	Liquid
Color	Colorless
Odor	Characteristic
Density	0.833 g/cm^3 @ 20°C
Melting / boiling point	-89°C/ 184°C
Flammability	No data available
Explosive properties	No data available
Self-ignition temperature	260°C
Vapor pressure	30 Pa @ 25°C
Mol weight	130.23 g/mol
Water solubility	Slightly soluble
Flash point	75°C
Octanol-water partition coefficient (Logk_{ow})	2.73

Exposure, Hazard and Safety Assessment

The following section describes possible exposures scenarios and hazards associated with ethylhexanol-2. The exposure assessment describes both the amount of and the frequency with which a chemical substance reaches a person, a population of people, or the environment. Hazard refers to the inherent properties of a substance that make it capable of causing harm to human health or the environment. The safety assessment reports the possibility of a harmful event arising from exposure to a chemical or physical agent under specific conditions. Just because a substance may possess potentially harmful properties does not mean that it automatically poses a risk. It is not possible to make that determination without understanding the exposure.

Human Health Effects

Human Exposure Assessment

Consumer: The majority of ethylhexanol-2 uses involve the transformation of the material into other substances and will not result in consumer exposures. Consumer exposure will be limited to low levels present within household products such as washing and cleaning products.

Worker: In industrial settings, ethylhexanol-2 is manufactured and handled in closed processes as much as possible, which ensures that worker exposure to ethylhexanol-2 is minimized. The proper use of personal protective equipment during loading, unloading, sampling or during maintenance operations will further minimize potential exposures to ethylhexanol-2.

Human Hazard Assessment:

Ethylhexanol-2 has low acute toxicity if ingested, moderate acute toxicity if inhaled and no acute toxicity if applied on skin. Ethylhexanol-2 is a skin irritant and capable of causing severe eye irritation. Ethylhexanol-2 is neither mutagenic or genotoxic, is not classified as a carcinogen and is not associated with adverse effects on fertility or unborn children. Ethylhexanol-2 does not present an aspiration hazard.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low acute toxicity if ingested. Moderate acute toxicity if inhaled. No acute toxicity up on contact with skin.
Irritation / corrosion Skin / eye / respiratory test	Causes skin irritation. Causes serious eye irritation. Causes respiratory irritation if inhaled.
Sensitization	May cause an allergic skin reaction up on contact with skin.
Toxicity after repeated exposure Oral / inhalation / dermal	Not anticipated to cause damage to internal organs or systems through prolonged or repeated exposure to low
Genotoxicity / Mutagenicity	Does not affect genetic system.
Carcinogenicity	Not considered as carcinogen.
Reproductive/Developmental Toxicity	Not anticipated to cause reproductive toxicity, not to damage unborn child.
Aspiration hazard	Not anticipated to cause aspiration toxicity if accidentally enter airways.

Human Health Safety Assessment

Consumer: Ethylhexanol-2 is mainly used as a chemical intermediate with no associated consumer exposure. Consumers may, however, be exposed to low levels present within household cleaning products. When working with formulations that contain appreciable concentrations of ethylhexanol-2, safety glasses should be worn and repeat or prolonged skin contact should be avoided. The use of appropriate handling and disposal methods will ensure that consumer exposure and subsequent risk associated with the use of products containing ethylhexanol-2 is unlikely.

Worker: In industrial settings ethylhexanol-2 is manufactured and handled primarily in closed processes which limit exposure. Based on good manufacturing processes and industrial hygiene, the occupational health risk associated with ethylhexanol-2 is low.

Environmental Effects

Environmental Exposures

Environmental exposure to ethylhexanol-2 is possible via the manufacturing process of this substance or when the substance is used in formulation under industrial settings – for example, while formulating into mixtures for inks, lubricant additives, lubricants or greases. In professional settings its use as a non-reactive processing aid also presents the potential for environmental exposure.

Environmental Hazard Assessment

Ethylhexanol-2 is readily biodegradable and has low potential for bioaccumulation. It has high solubility in water and, if accidentally released to soil or water, moderate volatilization to the atmosphere can be anticipated. Ethylhexanol-2 is not expected to adsorb to suspended solids and sediment. Volatilization from moist soil surfaces is expected to be an important fate process.

Effect Assessment	Result
Aquatic toxicity	Harmful to aquatic life

Fate and behavior	Result
Biodegradation	Readily biodegradable
Bioaccumulation potential	Not bioaccumulative (log K_{ow} = 2.73)
PBT / vPvB conclusion	This substance is not considered to be persistent, bioaccumulating and toxic (PBT) or very persistent and very bioaccumulating (vPvB)

Environmental Safety Assessment

Ethylhexanol-2 is harmful to aquatic life. If a release into the aquatic environment did occur, ethylhexanol-2 is anticipated to have a minimal effect on aquatic organisms as it will degrade quickly and has low potential for bioaccumulation. Overall, this substance is not considered to be PBT or vPvB).

Risk Management Recommendations

Exposure to ethylhexanol-2 in the workplace can be controlled by sufficient ventilation, proper handling and storage techniques, and the use of appropriate personal protective equipment, as recommended in the SDS. Consumer products are not anticipated to contain significant levels of ethylhexanol-2.

A selection of occupational exposure limits is presented below:

- Austria. Limit values regulation - Annex I: Substance list ZAT_MAK (Time Weighted Average): 50 ppm; 270 mg/m3
- Switzerland. Limit values at the work place (Time Weighted Average): 20 ppm; 110 mg/m3
- Germany. TRGS 900 - Occupational exposure limit values (Time Weighted Average): 10 ppm; 54 mg/m3
- Poland. Occupational exposure limits for airborne toxic substances (Maximal Admissible Concentration): 160 mg/m3
- Russia. Hygienic standards GN 2.2.5.1313-03 (Maximum Permissible Concentration - Short Term Exposure): 10 mg/m3
- Finland. HTP Values - Concentrations Known to be Harmful (Long term exposure limit): 1 ppm; 5.4 mg/m3

Regulatory Agency Review

Ethylhexanol-2 is on the following lists:

AIHA - Emergency Response Planning Guidelines (ERPGs)
ATSDR - 2015 Priority List of Hazardous Substances - Exposure Points
ATSDR - 2015 Priority List of Hazardous Substances - Frequency Points
ATSDR - 2015 Priority List of Hazardous Substances - Rank and Summary
ATSDR - 2015 Priority List of Hazardous Substances - Source Contribution Points
ATSDR - 2015 Priority List of Hazardous Substances - Toxicity Points
Australian Inventory of Chemical Substances (AICS)
Austria - Occupational Exposure Limits (OELs)
Carcinogenic Potency Database (CPDB) - Summary of Carcinogenicity Results - Rats and Mice
China - Chemical Inventory of Existing Chemical Substances (IECSC) - CAS Numbers
DOE Protective Action Criteria (PAC)

ECHA - Draft Community Rolling Action Plan (CoRAP) (2013-2015)
ECHA - Draft Community Rolling Action Plan (CoRAP) (2014-2016)
ECHA - List of Pre-registered Substances
Environment Canada - Chemical Management Plan - Status of Prioritized Substances
Environment Canada - Domestic Substances List (DSL)
Environment Canada - Domestic Substances List (DSL) - Human Health Categorization
Environment Canada - Domestic Substances List (DSL) Categorization of Existing Substances
Environment Canada - Hazardous Products Act (HPA) - Ingredient Disclosure List (IDL)
EPA - Chemical Update System (CUS) - 2002
EPA - Clean Air Act - Section 111 - Standards of Performance for New Stationary Sources of Air Pollutants
EPA - Fragrance Ingredient List
EPA - Inert Ingredients - Fragrance Use
EPA - Inert Ingredients in Pesticide Products
EPA - Inert Ingredients Permitted for Use In Nonfood Pesticide Products
EPA - Master Testing List
EPA - Master Testing List (1996)
EPA - Office of Pollution Prevention and Toxics (OPPT) High Production Volume (HPV) Program - 1990
EPA - TSCA - 12(b) - Export Notification
EPA - TSCA - 8(d) - Health and Safety Data Rule (HSDR) Rule Terminations
EPA - TSCA - 8D Health and Safety Data Rule (HSDR) (a) - Specific Chemicals
EPA - TSCA - Inventory
EPA - TSCA 4 Tests - Testing of Existing Chemicals
EPA - TSCA Section 4 Testing Results
EU - Approved Flavouring Substances
EU - Cosmetic Ingredients and Fragrance Inventory
EU - European Inventory of Existing Commercial Substances (EINECS)
FDA - Cumulative Estimated Daily Intake/Acceptable Daily Intake Table
FDA - Everything Added to Food In The United States (EAFUS)
FDA - Inventory of Effective Food Contact Substance (FCS) Notifications
Germany - Occupational Exposure Limits (OELs)
Massachusetts Department of Public Health - Massachusetts Substance List (MSL)
Mexico - National Inventory of Chemical Substances
National Cancer Institute - SMILES Notations
New Zealand - Inventory of Chemicals (NZIoC)
OECD - High Production Volume (HPV) Chemicals - 2004
OECD - High Production Volume (HPV) Chemicals - 2007
Pennsylvania - Hazardous Substance List
Philippine Inventory of Chemicals and Chemical Substances (PICCS)
Russia - Occupational Exposure Limits (OELs)
Switzerland - Occupational Exposure Limits (OELs)
Technischen Regeln für Gefahrstoffe (TRGS) - TRGS900
TEDX List of Potential Endocrine Disruptors
TETRATOX - Toxicity and Chemical Descriptor Data for 500 Aliphatic Chemicals
The Netherlands - Occupational Exposure Limits (OELs)

Regulatory Information / Classification and Labeling

Under the Globally Harmonized System for classification and labeling (GHS), substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and the (Extended) SDS. 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.

GHS Classification:

Flammable liquids - Category 4
Acute toxicity (Oral) - Category 5
Acute toxicity (Inhalation) - Category 4
Skin corrosion/irritation - Category 2
Serious eye damage/eye irritation - Category 2A
Specific target organ toxicity - single exposure - Category 3 (Respiratory system)
Acute aquatic toxicity - Category 3

Hazard Statements:

H227: Combustible liquid.
H303: May be harmful if swallowed.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.
H402: Harmful to aquatic life.

Signal Word: Warning

Precautionary Statements:

P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261: Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264: Wash skin thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/ eye protection/ face protection.

Hazard Pictograms:

Conclusion

Ethylhexanol-2 is used as a chemical intermediate and will not result in consumer exposures. Consumer exposure will be limited to low levels present within household product formulations such as washing and cleaning products. When handled responsibly, the potential for toxicity can be minimized, allowing consumers and workers to use materials containing ethylhexanol-2 safely.

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/sustainability/product/product-stewardship

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REACH registration is specific to Importers/Manufacturers that place the chemical on the EU market, and is 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.