Product Safety Assessment

Isobutyl Heptyl Ketone

Select a Topic:

Names
Product Overview
Manufacture of Product
Product Description
Product Uses
Exposure Potential
Health Information
Environmental Information
Physical Hazard Information
Regulatory Information
Additional Information
References

Names
- CAS No. 123-18-2
- ECOSOFT™ Solvent IK
- Isobutyl heptyl ketone
- Nonan-4-one, 2,6,8-trimethyl-
- EC No. 204-607-3
- IBHK
- 2,6,8-Trimethylnonan-4-one
- 4-Nonanone, 2,6,8-trimethyl-

Product Overview
- Isobutyl heptyl ketone is a low viscosity liquid with strong solvent properties and a strong, unpleasant odor. It is safer to use and results in fewer environmental emissions than conventional ketone solvents. The material is marketed by Dow under the trade name ECOSOFT™ Solvent IK. For further details, see Product Description.
- The primary uses of isobutyl heptyl ketone are as a cleaning and degreasing solvent, an extraction solvent in mining, a chemical intermediate to produce 2,6,8-trimethyl-4-nonanol, and a solvent for certain coatings. For further details, see Product Uses.
- Dow does not sell isobutyl heptyl ketone for direct consumer use, but exposure can occur either in an isobutyl heptyl ketone manufacturing facility or in the various industrial, manufacturing, or mining facilities that use this material. For further details, see Exposure Potential.
- Eye or skin contact with isobutyl heptyl ketone may result in irritation. Prolonged inhalation or inhalation of heated vapors may be harmful. This material can result in damage if aspirated into the lungs. See Health Information or Physical Hazard Information.
- Isobutyl heptyl ketone is biodegradable, has moderate potential to accumulate in the food chain, and is moderately toxic to fish and aquatic organisms. For further details, see Environmental Information.
- Isobutyl heptyl ketone liquid and vapors are combustible. Store away from strong acids, strong bases, strong oxidizers, or copper and copper alloys. For further details, see Physical Hazard Information.

Back to top

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Manufacture of Product

- **Capacity** – Dow is the exclusive producer of isobutyl heptyl ketone, producing at facilities in Institute, West Virginia (USA).
- **Process** – Isobutyl heptyl ketone is produced from acetone in a series of base-catalyzed aldol condensation and hydrogenation reactions.

Product Description

Isobutyl heptyl ketone is a low viscosity liquid with strong solvent properties and a strong, unpleasant odor. Because it has a higher boiling point and lower evaporation rate than most ketone solvents, it is safer to use and results in fewer environmental emissions. The material is marketed by Dow under the trade name ECOSOFT™ Solvent IK. The major impurity (less than 4%) is 2,6,8-trimethyl-4-nonanol (CAS No. 123-17-1).

Product Uses

Isobutyl heptyl ketone is used in the following applications:

- **Cleaning and degreasing materials** – as a solvent and also for dewaxing and extraction in mining
- **Coatings** – as a solvent
- **Inks** – as a solvent
- **Fragrances** – as a solvent
- **Chemical intermediate** – to produce 2,6,8-trimethyl-4-nonanol (CAS No. 123-17-1)

Exposure Potential

Isobutyl heptyl ketone may be used in the production of industrial products. Based on the uses for this material, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in an isobutyl heptyl ketone manufacturing facility or in the various industrial, manufacturing, or mining facilities that use this material. It is produced, distributed, stored, and consumed in closed systems. Those working with isobutyl heptyl ketone in manufacturing and mining operations could be exposed during maintenance, sampling, testing, or other procedures. Each facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. See Health Information.
- **Consumer exposure to products containing isobutyl heptyl ketone** – Dow does not sell isobutyl heptyl ketone for direct consumer use. It may be a component of commercial cleaning and degreasing solvent formulations or fragrance formulations. See Health Information.
- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Respiratory protection is necessary for cleaning up spills and leaks. Eliminate all sources of ignition. See Environmental, Health, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Positive pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask is recommended for emergency work. See Environmental, Health, and Physical Hazard Information.
• **In case of fire** – Keep people away. Deny any unnecessary entry into the area. Use water fog or fine spray, dry chemical or carbon-dioxide fire extinguishers, or foam to extinguish the fire. Alcohol-resistant foams are preferred. Use of a direct water stream may spread the fire since the material floats on water. Firefighters should wear positive pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Back to top**

**Health Information**

**Eye and Skin Contact** – Eye contact with isobutyl heptyl ketone may result in slight irritation or slight corneal injury. Prolonged skin contact with isobutyl heptyl ketone may result in slight irritation with local redness, but is unlikely to result in absorption of harmful amounts.

**Inhalation** – Because of its low volatility, the potential for isobutyl heptyl ketone vapor exposure is minimal. However, prolonged, excessive exposure or exposure to heated vapors may result in adverse effects.

**Ingestion** – Isobutyl heptyl ketone has very low toxicity. Harmful effects would not be expected from swallowing small amounts. However, aspiration into the lungs, which could occur after ingestion or vomiting, may result in lung damage, even death, due to chemical pneumonia. Repeated dose animal studies have reported effects on the kidney, liver, and thyroid.

**Other** – No effects have been noted on fetal development, fertility, or reproduction; however, in a screening study, body weights of newborn animals were decreased. In vitro genetic toxicity studies were negative.

For more information, see the relevant Safety Data Sheet.

**Back to top**

**Environmental Information**

Isobutyl heptyl ketone has low volatility and will evaporate slowly from products containing it. The substance is poorly soluble in water, and when introduced, will have a moderate tendency to evaporate from water. IBHK has a medium tendency to bind to soil or sediment.

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions. Isobutyl heptyl ketone is removed from water and soil environments, including wastewater treatment plants. It is not expected to persist in the environment.

Isobutyl heptyl ketone has moderate potential to accumulate in the food chain and is moderately toxic to aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

**Back to top**

**Physical Hazard Information**

Isobutyl heptyl ketone liquid and vapors are combustible. Keep this material away from ignition sources. Store away from incompatible materials such as strong acids, strong bases, strong
Product Safety Assessment: Isobutyl heptyl ketone

oxidizers, or copper and copper alloys. Exposure to elevated temperatures can lead to decomposition.

For more information, see the relevant Safety Data Sheet.

Back to top

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of isobutyl heptyl ketone. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Back to top

Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- ECOSOFT™ Solvent IK, Technical Data Sheet, The Dow Chemical Company, Form No. 327-00050-0405 (http://msdssearch.dow.com/PublishedLiteratureDOWCOM/dh_0119/0901b8038011948e.pdf?filepath=oxysolvents/pdfs/noreg/327-00050.pdf&fromPage=GetDoc)

For more business information about ECOSOFT™ Solvent IK and other acetone derivatives, visit the Dow Oxygenated Solvents web site at www.dowsolvents.com.

Back to top

References

1 ECOSOFT™ Solvent IK, Technical Data Sheet, The Dow Chemical Company, Form No. 327-00050-0405
2 Isobutyl Heptyl Ketone Safety Data Sheet for the US, The Dow Chemical Company
5 Estimates by The Dow Chemical Company.
NOTICES:

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Form No. 233-00567-MM-1214X