Product Safety Assessment
DOW™ Methyl Isobutyl Carbinol

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Names

- CAS No. 108-11-2
- Methyl isobutyl carbinol
- DOW™ methyl isobutyl carbinol
- Isobutyl methyl carbinol
- 4-Methyl-2-amyl alcohol
- 4-Methyl-2-pentanol
- MIBC
- 4-Methyl pentan-2-ol
- 1,3-Dimethyl butanol

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Product Overview

- DOW™ methyl isobutyl carbinol is a colorless, stable liquid with a mild alcohol odor.[1] For further details, see Product Description.
- The major application for DOW methyl isobutyl carbinol is the manufacture of lube-oil additives, followed by its use as a flotation frother in treating metal ores.[2] For further details, see Product Uses.
- Methyl isobutyl carbinol has minimal acute toxicity by oral and dermal routes of exposure. Anesthetic effects, typical of organic solvents, can be expected at high vapor concentrations.[3] For further details, see Health Information.
- Human exposure to DOW methyl isobutyl carbinol is limited based on its use patterns. With one exception, the material is used in closed systems and only catastrophic failure would result in appreciable exposure.[4] For further details, see Exposure Potential.
- DOW methyl isobutyl carbinol is thermally stable at recommended storage and use temperatures and pressures.[5] For further details, see Physical Hazard Information.
- Methyl isobutyl carbinol is readily biodegradable, unlikely to accumulate in the food chain, and is considered practically non-toxic to fish and other aquatic organisms on an acute basis. For further details, see Environmental Information.

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Manufacture of Product

- **Capacity –** Based on publicly available information, U.S. production and sales of methyl isobutyl carbinol were estimated to be 19,000 metric tonnes (42 million pounds) in 2001.[6] Dow produces methyl isobutyl carbinol at facilities in Institute, West Virginia (USA).[7]

- **Process –** DOW™ methyl isobutyl carbinol is recovered as a co-product during methyl isobutyl ketone (MIBK) manufacture or produced by hydrogenation of MIBK.[8]

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Product Description[9]

DOW™ methyl isobutyl carbinol is a flammable, colorless stable liquid with a mild alcohol odor. It is slightly soluble in water and miscible with most organic solvents.

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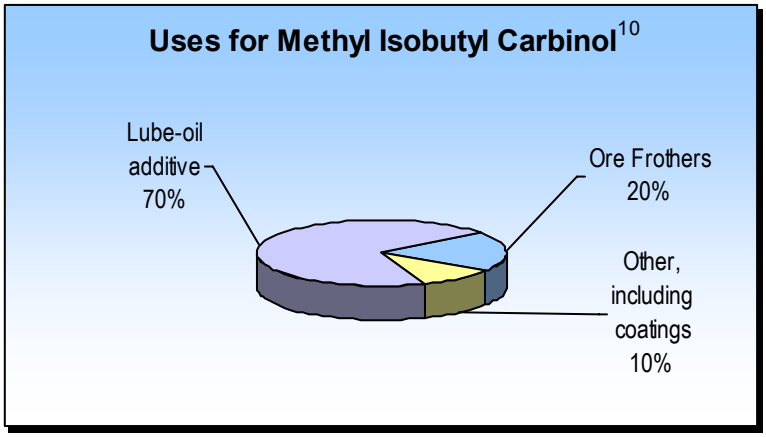
Product Uses[10,11]

The major application of methyl isobutyl carbinol is in the manufacture of lube-oil additives, followed by its use as a flotation frother in treating copper ore and ores of other metals. Use as a solvent in surface coatings comprises a minor portion of MIBC consumption.



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Exposure Potential[12,13]

DOW™ methyl isobutyl carbinol is 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 a methyl isobutyl carbinol manufacturing facility or in the various industrial or manufacturing facilities that use this material. In most applications, this product is produced, distributed, stored, and consumed in closed systems. Those working with methyl isobutyl carbinol in manufacturing, mining, coating or other operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing 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 methyl isobutyl carbinol** – Dow does not sell methyl isobutyl carbinol for direct consumer use, and it is unlikely to be present in any product a consumer would handle. See Health Information.
- **Environmental releases** – Methyl isobutyl carbinol is moderately volatile and moderately soluble in water. Once introduced to water it will have a tendency to remain in water. Because methyl isobutyl carbinol is readily biodegradable, it will be removed by sewage treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Eliminate all sources of ignition immediately. 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. Eliminate all sources of ignition immediately. Use only explosion-proof equipment. Ground and bond all containers and handling equipment. See Environmental, Health, and Physical Hazard Information.
- **In case of fire** – Deny any unnecessary entry into the area. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam to fight the fire. Alcohol-resistant foam is

preferred. Use of a direct water stream may spread the fire. The public should be warned of any downwind vapor explosion hazards. Vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Keep vapors out of sewers. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask and protective firefighting clothing. See Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

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Health Information[14,15]

Eye and Skin Contact – May cause moderate eye irritation or moderate corneal injury. Exposure to methyl isobutyl carbinol vapor may cause eye irritation, mild discomfort, and redness. Prolonged skin contact may cause slight irritation and local redness or drying and flaking of the skin, but is unlikely to result in absorption of harmful amounts.

Inhalation – Prolonged, excessive exposure to methyl isobutyl carbinol may cause adverse effects. Excessive exposure may cause irritation to the upper respiratory tract and lungs. Symptoms of excessive vapor exposure may be anesthetic or narcotic effects, dizziness, and drowsiness.

Ingestion – Methyl isobutyl carbinol has low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Excessive exposure – Excessive exposure may cause anesthetic or narcotic effects, dizziness, and drowsiness. Kidney toxicity has been reported in animal studies.

Other – Methyl isobutyl carbinol is unlikely to be mutagenic in humans. Based on the available data from animal studies, this material is not expected to be a human reproductive or developmental toxicant.

For more information, see the relevant Safety Data Sheet.

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Environmental Information[16,17]

DOW™ methyl isobutyl carbinol is moderately volatile and moderately soluble in water. As a result when introduced to water, the chemical will have a tendency to remain in water. It has low potential to bind to soil or sediment.

DOW methyl isobutyl carbinol is unlikely to persist in the environment. The compound is readily biodegradable, which suggests the chemical will be rapidly and completely removed from water and soil environments, including biological wastewater treatment plants.

DOW methyl isobutyl carbinol is not likely to accumulate in the food chain (bioconcentration potential is low) and is practically nontoxic to fish and other aquatic organisms on an acute basis.

The Organisation for Economic Co-operation and Development (OECD) Screening Information Data Set (SIDS) Initial Assessment Profile for methyl isobutyl carbinol concluded that the

chemical has a low hazard profile and, thus, is currently of low priority for further work. The profile document may be accessed at http://www.chem.unep.ch/irptc/sids/OECDSIDS/108112.pdf.

For more information, see the relevant Safety Data Sheet.

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Physical Hazard Information[18]

DOW™ methyl isobutyl carbinol is thermally stable at recommended temperatures and pressures. Hazardous polymerization will not occur, however, exposure to elevated temperatures can cause the product to decompose. Decomposition of the product depends upon temperature, air supply, and the presence of other materials. Avoid contact with acid chlorides, acids, and oxidizers.

For more information, see the relevant Safety Data Sheet.

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of DOW™ methyl isobutyl carbinol. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet.

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Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- *Storage and Handling of Higher Aliphatic Alcohols,* The Dow Chemical Company, Solvents and Coatings Materials Report Number SH143, November 1990
- *Methyl Isobutyl Carbinol Product Information,* The Dow Chemical Company, Form No. 327-00049-0405, September 2002 (http://www.dow.com/PublishedLiterature/dh_0119/0901b803801195c7.pdf?filepath=oxysolvents/pdfs/noreg/327-00049.pdf&fromPage=GetDoc)
- Camara Greiner, Elvira O. and Yokose, Kazuteru, *Product Review: Methyl Isobutyl Ketone (MIBK) and Methyl Isobutyl Carbinol (MIBC)*, *Chemical Economics Handbook*, SRI International, August 2002 (http://www.sriconsulting.com/CEH/Public/Reports/675.6000)
- *Screening Information Data Set (SIDS) Initial Assessment Report for SIAM 21 – 4-Methylpentan-2-ol CAS No. 108-11-2*, Organisation for Economic Co-operation and Development (OECD),United Nations Environment Programme (UNEP): Washington, D.C., October 21, 2005 (http://www.inchem.org/documents/sids/sids/108112.pdf)
- Linak, Eric, *Global Solvent Report: The Green Impact,* SRI Consulting, 2006

For more business information about DOW™ methyl isobutyl carbinol, visit the Dow Oxygenated Solvents website at www.dow.com/oxysolvents/prod/acids.htm#alcohols.

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References

[1] *Methyl Isobutyl Carbinol Product Information,* The Dow Chemical Company, Form No. 327-00049-0405, September 2002, page 1.
[2] Camara Greiner, Elvira O. and Yokose, Kazuteru, "Product Review: Methyl Isobutyl Ketone (MIBK) and Methyl Isobutyl Carbinol (MIBC)," *Chemical Economics Handbook*, SRI International, August 2002, page 4.
[3] *Screening Information Data Set (SIDS) Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, Organisation for Economic Co-operation and Development (OECD),United Nations Environment Programme (UNEP), Washington, D.C., October 21, 2005, page 14.
[4] *SIDS Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, UNEP Publications, Washington, D. C., October 21, 2005, page 9.
[5] *Methyl Isobutyl Carbinol Material Safety Data Sheet*, The Dow Chemical Company, September 21, 2007, pages 4–5.
[6] Camara Greiner, Elvira O. and Yokose, Kazuteru, "Product Review: Methyl Isobutyl Ketone (MIBK) and Methyl Isobutyl Carbinol (MIBC)," *Chemical Economics Handbook*, SRI International, August 2002, page 8.
[7] Camara Greiner, Elvira O. and Yokose, Kazuteru, "Product Review: Methyl Isobutyl Ketone (MIBK) and Methyl Isobutyl Carbinol (MIBC)," *Chemical Economics Handbook*, SRI International, August 2002, page 6.
[8] *SIDS Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, UNEP Publications, Washington, D. C., October 21, 2005, page 8.
[9] *Methyl Isobutyl Carbinol Product Information,* The Dow Chemical Company, Form No. 327-00049-0405, September 2002, pages 1 and 2.
[10] Camara Greiner, Elvira O. and Yokose, Kazuteru, "Product Review: Methyl Isobutyl Ketone (MIBK) and Methyl Isobutyl Carbinol (MIBC)," *Chemical Economics Handbook*, SRI International, August 2002, page 11.
[11] *SIDS Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, UNEP Publications, Washington, D. C., October 21, 2005, page 6.
[12] *Methyl Isobutyl Carbinol Material Safety Data Sheet*, The Dow Chemical Company, September 21, 2007, pages 2–5.
[13] *SIDS Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, UNEP Publications, Washington, D. C., October 21, 2005, page 9.
[14] *Methyl Isobutyl Carbinol Material Safety Data Sheet*, The Dow Chemical Company, September 21, 2007, pages 1–2.
[15] *SIDS Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, UNEP Publications, Washington, D. C., October 21, 2005, pages 5–6.
[16] *Methyl Isobutyl Carbinol Material Safety Data Sheet*, The Dow Chemical Company, September 21, 2007, pages 5–6.
[17] *SIDS Initial Assessment Report for SIAM 21: 4-Methylpentan-2-ol CAS No. 108-11-2*, UNEP Publications, Washington, D. C., October 21, 2005, pages 6 and 9.
[18] *Methyl Isobutyl Carbinol Material Safety Data Sheet*, The Dow Chemical Company, September 21, 2007, pages 4–5.

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