Product Safety Assessment
Propylene Glycol Phenyl Ether

Select a Topic:

Names

- CAS No. 770-35-4 (major isomer)
- Propylene glycol phenyl ether
- PPh
- 1-Phenoxy-2-propanol
- 1-Phenoxypropan-2-ol
- Phenoxyisopropanol
- Propylene phenoxetol
- 2-Propanol, 1-phenoxy-
- DOWANOL™ PPh glycol ether

Product Overview

- Propylene glycol phenyl ether (PPh) is a colorless to yellow liquid with a mild odor. PPh evaporates slowly and doesn't mix with water. The Dow Chemical Company (Dow) markets PPh and other propylene oxide-based glycol ethers under the trade name DOWANOL™ glycol ethers.[1] For further details, see Product Description.
- PPh is used as a solvent and coalescing agent. PPh is formulated into architectural and industrial coatings, electrodeposition coatings, textile dyes, textile printing pastes, paint removers, latex adhesives and inks for ball-point pens, felt-tip pens, and stamp pads.[2] For further details, see Product Uses.
- Because PPh is formulated into a broad range of products, consumer contact is possible. Workplace exposure is also possible.[3] For further details, see Exposure Potential.
- Eye contact with PPh may cause severe irritation with slight corneal injury. Prolonged skin contact may cause slight irritation with local redness, but is unlikely to result in absorption of harmful amounts. At room temperature, vapors are minimal due to low volatility. Vapor from heated material or mist may be hazardous.[4] For further details, see Health Information.
- PPh is readily biodegradable, unlikely to accumulate in the food chain, and is practically non-toxic to fish and aquatic organisms. For further details, see Environmental Information.
- PPh is stable at typical use temperatures. PPh is incompatible with strong acids, strong bases, and strong oxidizers and contact should be avoided.[5] For further details, see Physical Hazard Information.

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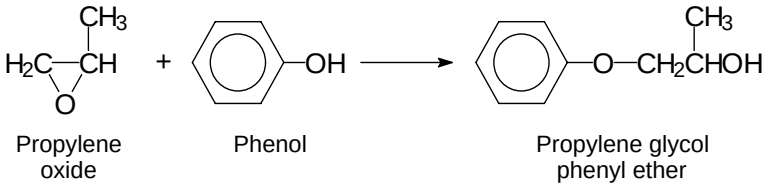
Manufacture of Product[6]

- **Capacity –** Western Europe is the largest producer and consumer of propylene oxide-based glycol ethers. Dow produces both ethylene oxide- and propylene oxide-based glycol ethers in the United

States at facilities Plaquemine, Louisiana; these products are also produced by a Dow subsidiary in Europe at the Stade, Germany site. Union Carbide Corporation ("UCC"), also a Dow subsidiary, manufactures glycol ethers in Taft, Louisiana, and Seadrift, Texas. The estimated 2007 U.S. production capacity for propylene oxide-based glycol ethers was 191,000 metric tons (420 million pounds).

- **Process –** PPh is manufactured by reacting propylene oxide with phenol as shown below.



Propylene oxide | Phenol | Propylene glycol phenyl ether

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Product Description[7,8,9]

Propylene glycol phenyl ether (PPh) is a colorless to yellow liquid with a mild odor. It evaporates slowly and is hydrophobic (does not mix with water). PPh has a minimum purity of 93% and is an isomeric mixture of 1-phenoxy-propan-2-ol (major isomer) and 2-phenoxy-propan-1-ol. These isomers are not separated or produced as individual chemicals. The remaining 7% consists of dipropylene glycol phenyl ether (di-PPh). PPh is a propylene oxide-based, or P-series, glycol ether. The Dow Chemical Company markets PPh and other P-series glycol ethers under the trade name DOWANOL™ glycol ethers.

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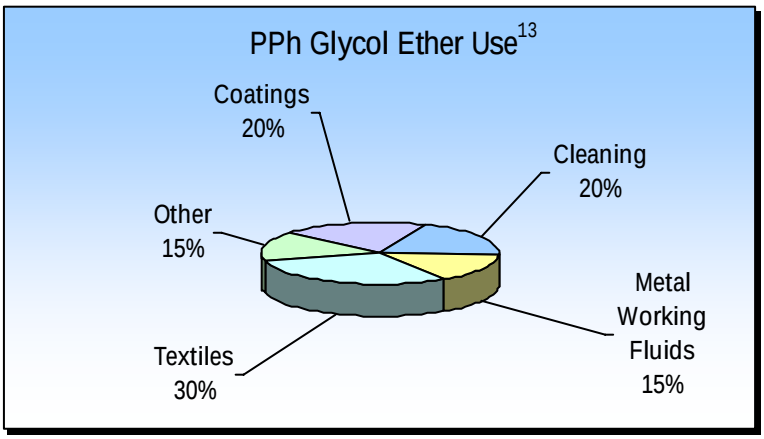
Product Uses[10,11,12,13]

PPh is used for the following industrial and residential applications:

- **Coatings –** for architectural and industrial applications
- **Textiles –** for dyes and printing pastes
- **Cleaners –** for household and industrial cleaners
- **Metal working fluids** – for surface cleaning and fabrication



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Exposure Potential

PPh is used in the production of industrial and consumer products. Based on the uses for PPh, the public could be exposed through:

- **Workplace exposure**[14,15] – Exposure can occur either in a PPh manufacturing facility or in the various industrial or manufacturing facilities that use PPh. Those working with PPh in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. PPh is manufactured in closed systems. Products made using PPh are formulated in closed systems as well. Worker exposure is most likely to occur while applying coating products containing PPh to various surfaces. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.
- **Consumer exposure to products containing PPh**[16] – Dow does not sell PPh for direct consumer use, but consumers can be exposed through the use of paints, ink pens, or other products

containing PPh. The typical PPh concentration in paint is 2 to 10%, in cosmetics and soaps 0.1 to 1%. See Health Information.

- **Environmental releases**[17] – PPh may slowly evaporate to air from coatings or other products containing it. Once PPh is introduced to water, the compound will tend to remain dissolved because it is slightly soluble in water. PPh is readily biodegradable, and the compound will be removed by sewage treatment plants.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, contain spilled material if possible. Pump the contained material into suitable and properly labeled containers using appropriate safety equipment.
- **In case of fire** – Keep people away and deny unnecessary entry. Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire-fighting clothing or fight the fire from a safe distance. *Do not use* a direct water stream; it may spread the fire. Use water fog or fine spray, carbon-dioxide or dry-chemical extinguishers, or foam. Water fog applied gently may be used as a blanket to extinguish the fire. Follow emergency procedures carefully. See Environmental Information, Health Information, and Physical Hazard Information.

For more information, review the relevant Safety Data Sheet.

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Health Information[18]

Eye contact with PPh may cause severe irritation with slight corneal injury. Prolonged skin contact may cause slight irritation with local redness, but is unlikely to result in absorption of harmful amounts. PPh did not cause sensitization in laboratory animals. At room temperature, vapors are minimal due to low volatility. Vapor from heated material or mist may be hazardous.

PPh has low toxicity if swallowed. Swallowing small amounts incidental to normal handling is unlikely to cause injury. However, swallowing larger amounts may cause injury.

Repeated skin contact caused minor skin effects but did not cause any effects in other tissues. PPh did not affect reproductive performance in laboratory animals, cause birth defects or demonstrate significant genetic toxicity.

For more information, review the relevant Safety Data Sheet.

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Environmental Information[19]

PPh has a low volatility, and may evaporate slowly from products containing it. Although it is only slightly soluble in water, once dissolved, the compound will tend to remain in water. It has minimal tendency to bind to soil or sediment.

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

PPh 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.

For more information, review the relevant Safety Data Sheet.

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Physical Hazard Information[20]

PPh is thermally stable at typical use temperatures. Store PPh in carbon steel, stainless steel, or phenolic-lined steel drums. Do not store in aluminum, copper, galvanized iron, or galvanized steel. PPh can decompose at elevated temperatures. Decomposition products depend upon the temperature, air supply, and the presence of other materials, but can include aldehydes, ketones, organic acids, and other compounds.

During a fire, smoke may contain the original material in addition to toxic or irritating combustion products, which may include carbon monoxide and carbon dioxide. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
For more information, review the relevant Safety Data Sheet.

PPh is incompatible with strong acids, strong bases, and strong oxidizers and contact should be avoided.

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of PPh. 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.

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Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.asp)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- *DOWANOL™ PPH Glycol Ether Product Information,* The Dow Chemical Company, Form No. 110-00622-0304, March 2004 (http://www.dow.com/PublishedLiterature/dh_0108/0901b80380108ecf.pdf?filepath=oxysolvents/pdfs/noreg/110-00622.pdf&fromPage=GetDoc)
- "Propylene Glycol Phenyl Ether," *SIDS Initial Assessment Report for 18 SIAM,* Organisation for Economic Co-operation and Development, Paris, France, April 20–23 (http://www.inchem.org/documents/sids/sids/770354.pdf).
- "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook*, SRI Consulting, July 2004

For more business information about PPh, visit Dow's Oxygenated Solvents web site. (http://www.dow.com/oxysolvents/index.htm)

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References

[1] *DOWANOL™ PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 1 and 3–4.
[2] *DOWANOL PPH Glycol Ether Product Information,* The Dow Chemical Company, Form No. 110-00622-0304, March 2004, pages 1–2.
[3] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, page 3.
[4] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 1–2 and 4.

[5] *DOWANOL™ PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, page 4.
[6] Chinn, Henry, "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook*, SRI Consulting, July 2004, pages 5, 15, 18, 27, and 29.
[7] Dow Oxygenated Solvents website – P-Series Glycol Ethers (http://www.dow.com/oxysolvents/prod/pseries.htm)
[8] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 1, 3, and 4.
[9] "Propylene Glycol Phenyl Ether," *SIDS Initial Assessment Report for 18 SIAM,* Organisation for Economic Co-operation and Development, April 20–23, Paris, France, page 7.
[10] Dow Oxygenated Solvents website – Applications Center: (http://www.dow.com/oxysolvents/app/index.htm).
[11] *DOWANOL PPH Product Information,* The Dow Chemical Company, Form No. 110-00622-0304, March, 2004, pages 1–2.
[11] Chinn, Henry, "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook*, SRI Consulting, July 2004, page 55.
[12] "Propylene Glycol Phenyl Ether," *SIDS Initial Assessment Report for 18 SIAM,* Organisation for Economic Co-operation and Development, April 20–23, Paris, France, pages 5, 6, and 9.
[13] Estimates by The Dow Chemical Company.
[14] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, page 3.
[15] "Propylene Glycol Phenyl Ether," *SIDS Initial Assessment Report for 18 SIAM,* Organisation for Economic Co-operation and Development, April 20–23, Paris, France, pages 5–6 and 12–13.
[16] "Propylene Glycol Phenyl Ether," *SIDS Initial Assessment Report for 18 SIAM,* Organisation for Economic Co-operation and Development, April 20–23, Paris, France, pages 5–6, 9, and 12–13.
[17] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 2–3.
[18] *DOWANOL™ PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 1–2 and 4.
[19] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 4–5.
[20] *DOWANOL PPH Glycol Ether Low Phenol Grade Material Safety Data Sheet*, The Dow Chemical Company, ID No. 50153/1001, Version 2.0, March 24, 2006, pages 2, 3, and 4.

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