

# 1,3-Propane sultone

1120-71-4

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## Hazard Summary

1,3-Propane sultone is used as a chemical intermediate. No information is available on the acute (short-term), chronic (long-term), reproductive, developmental, and carcinogenic effects of 1,3-propane sultone in humans. In rodents exposed to 1,3-propane sultone via gavage (experimentally placing the chemical in the stomach) and intravenous injection, tumors of the brain and other central nervous system (CNS) tissues have been observed. Leukemia, and tumors of the ear duct, small intestine, kidneys, lung, mammary gland, uterus, and skin have been reported in rodents exposed via gavage, injection, or dermal contact. The International Agency for Research on Cancer (IARC) has classified 1,3-propane sultone as a Group 2B, possible human carcinogen.

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Please Note: The main sources of information for this fact sheet are IARC's Monograph on the Evaluation of the Carcinogenic Risk of 1,3-Propane Sultone (4) and the Hazardous Substances Data Bank (HSDB), a database of summaries of peer-reviewed literature.(3)

## Uses

- 1,3-Propane sultone is used as a chemical intermediate to introduce sulfopropyl groups into molecules and to confer water solubility and anionic character. (3,4)

## Sources and Potential Exposure

- Occupational exposure to 1,3-propane sultone may occur during its manufacture and use. (1)

## Assessing Personal Exposure

- No information was located regarding the measurement of personal exposure to 1,3-propane sultone.

## Health Hazard Information

### Acute Effects:

- No information is available on the acute health effects of 1,3-propane sultone in humans or animals.

### Chronic Effects (Noncancer):

- No information is available on the chronic health effects of 1,3-propane sultone in humans or animals.
- EPA has not established a Reference Concentration (RfC) or a Reference Dose (RfD) for 1,3-propane sultone.

### Reproductive/Developmental Effects:

- No information is available on the reproductive or developmental effects of 1,3-propane sultone in humans.
- In the offspring of pregnant rats given a single intravenous injection of 1,3-propane sultone during gestation, malignant neurogenic tumors and tumors of the pancreas and ovary were reported. (2,3,4)

## Cancer Risk:

- No information is available on the carcinogenic effects of 1,3-propane sultone in humans.
- In rats orally exposed to 1,3-propane sultone via gavage, tumors of the brain and other CNS tissues have been observed, as well as leukemia, and tumors of the ear duct and small intestine. (2,3,4)
- Skin tumors, lymphoreticular and lung neoplasms, and, in females, mammary gland and uterine tumors have been reported in mice following dermal exposure. (3)
- Following subcutaneous injection, local tumors were observed at the site of injection. Following intravenous injection, tumors of the tissues of the CNS, brain, kidneys, and lung have been reported. (2,3,4)
- EPA has not classified 1,3-propane sultone for carcinogenicity.
- IARC has classified 1,3-propane sultone as a Group 2B, possible human carcinogen. (4)
- The California Environmental Protection Agency (CalEPA) calculated an inhalation unit risk factor of  $6.9 \times 10^{-4} (\mu\text{g}/\text{m}^3)^{-1}$  and an oral cancer slope factor of  $2.4 (\text{mg}/\text{kg}/\text{d})^{-1}$ . (2)

## Physical Properties

- The chemical formula for 1,3-propane sultone is  $\text{C}_3\text{H}_6\text{O}_3\text{S}$ , and its molecular weight is 122.1 g/mol. (3,4)
- 1,3-Propane sultone occurs as a colorless liquid or white crystals and is soluble in water. (3,4)
- 1,3-Propane sultone has a foul odor when heated; its odor threshold has not been established. (3)

Note: There are very few health numbers or regulatory/advisory numbers for 1,3-propane sultone; thus, a graph has not been prepared for this compound. The health information cited in this factsheet was obtained in December 1999.

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## Conversion Factors:

To convert concentrations in air (at 25 °C) from ppm to  $\text{mg}/\text{m}^3$ :  $\text{mg}/\text{m}^3 = (\text{ppm}) \times (\text{molecular weight of the compound}) / (24.45)$ . For 1,3-propane sultone:  $1 \text{ ppm} = 4.99 \text{ mg}/\text{m}^3$ . To convert concentrations in air from  $\mu\text{g}/\text{m}^3$  to  $\text{mg}/\text{m}^3$ :  $\text{mg}/\text{m}^3 = (\mu\text{g}/\text{m}^3) \times (1 \text{ mg}/1,000 \mu\text{g})$ .

Summary created in April 1992, updated January 2000

## References

1. M. Sittig. Handbook of Toxic and Hazardous Chemicals and Carcinogens. 2nd ed. Noyes Publications, Park Ridge, NJ. 1985.
2. California Environmental Protection Agency (CalEPA). Air Toxics Hot Spots Program Risk Assessment Guidelines: Part II. Technical Support Document for Describing Available Cancer Potency Factors. Office of Environmental Health Hazard Assessment, Berkeley, CA. 1999.
3. U.S. Department of Health and Human Services. Hazardous Substances Data Bank (HSDB, online database). National Toxicology Information Program, National Library of Medicine, Bethesda, MD. 1993.
4. International Agency for Research on Cancer (IARC). IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man: Some Aromatic Amines, Hydrazine and Related Substances, N-Nitroso Compounds and Miscellaneous Alkylating Agents. Volume 4. World Health Organization, Lyon. 1974.