



Product Stewardship Summary

1,1,1,3,3-Pentachloropropane (5CP or HCC 240fa)

Summary

5CP is a colorless clear liquid that has a slight pesticide-like odor. It is manufactured utilizing a patented technology by reacting carbon tetrachloride and vinyl chloride in the presence of a catalyst mixture. 5CP is used as a reactant in the liquid phase catalytic fluorination process to form HFC-245fa, a commercially important refrigerant that is used as a replacement for products containing ozone depleting fluorocarbon refrigerants.

1. Chemical Identity

Name: Propane, 1,1,1,3,3-pentachloro-
Synonyms: 5CP; 1,1,1,3,3-Pentachloropropane, VFS 8648.50, HCC-240fa
Chemical Abstracts Service (CAS) number: 23153-23-3
Chemical Formula: C₃H₃Cl₅
Molecular Weight: 216.32

2. Production

The production of 5CP is accomplished by reacting carbon tetrachloride and vinyl chloride in the presence of a catalyst mixture comprising an organophosphate solvent, iron metal and ferric chloride under conditions sufficient to produce 5CP.

3. Uses

5CP is used as a reactant with hydrofluoric acid (HF) in the liquid phase catalytic fluorination to produce HFC-245fa, a commercially important refrigerant replacement for environmentally deficient products containing fluorocarbons, which are known to be ozone depletion compounds.

4. Physical and Chemical Properties

5CP is a clear, colorless liquid with a slight pesticide-like odor. It is a slight fire hazard with a flashpoint at 225 °F. The liquid can vaporize and may collect in low lying areas. Hazardous decomposition products include chlorine, hydrogen chloride, phosgene, and oxides of carbon; therefore, it is important to avoid heat, flames, sparks and other sources of ignition.

5. Health Effects

Eye Contact

May cause eye irritation with tearing, redness, or a stinging or burning feeling. May cause swelling of the eyes with blurred vision. Effects may become more serious with repeated or prolonged contact.

Skin Contact

May cause skin irritation with redness, an itching or burning feeling, and swelling of the skin. Effects may become more serious with repeated or prolonged contact. Long-term contact may cause the skin to dry and crack or develop a rash.

Inhalation

Breathing this material is harmful, and can cause death depending upon level and duration of exposure. Breathing this material may cause central nervous system depression with symptoms including nausea, headache, dizziness, fatigue, drowsiness, or unconsciousness. Breathing high concentrations of this material, for example, in an enclosed space or by intentionally breathing it, can cause irregular heartbeats which can cause death.

Studies in laboratory animals indicate that exposure to vapors of this material can cause adverse effects on the liver, kidney, and nasal epithelium. This material was not a skin sensitizer in guinea pigs. 5CP is not significantly absorbed across the skin.

Reproductive Studies

Based on available data, it is not known whether exposure of the mother to this material can cause harm to the fetus. Overexposure to similar materials has been shown to cause adverse effects on the fetus.

Cancer Studies

5CP is not classified as a carcinogen by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), or the Occupational Safety and Health Administration (OSHA).

6. Environmental Effects

5CP may adversely affect aquatic life. This material will not degrade readily if released in water. This material is believed not to bioconcentrate in aquatic systems.

7. Exposure

5CP is harmful if inhaled and is moderately irritating to the skin and eyes. The most likely modes of exposure are:

- Worker exposure – Exposure could occur in the manufacturing facility or in industrial facilities that use 5CP. When exposures occur, they are typically inhalation. Exposure to skin or eye causing moderate irritation could also occur. Good industrial hygiene practices and the use of personal protective equipment minimize the risk of exposure.
- Consumer exposure – OxyChem does not sell 5CP in the retail market.
- Releases – If a spill occurs, emergency personnel should wear protective equipment to minimize exposures.

8. Recommended Risk Management Measures

Prior to using 5CP, carefully read and comprehend the Material Safety Data Sheet. The following are some risk management measures that are effective against the hazards of 5CP:

- Use only in well-ventilated areas. Provide local exhaust ventilation where vapors, mist or aerosols may be generated.

- Work areas where 5CP is used should be well ventilated to maintain concentrations below exposure limits. If exposures exceed accepted limits or if respiratory discomfort is experienced, use a NIOSH approved full-face air purifying respirator with organic vapor cartridges. If concentrations are unknown or at or above 5 ppm, an approved self-contained breathing apparatus operated in the pressure demand mode is required.
- Wear chemical safety goggles with a faceshield to protect against eye and skin contact when appropriate. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
- Wear medium weight (22 – 30 mil) or heavier solvent resistant gloves made of nitrile to prevent skin contact.
- Wear chemical resistant clothing to prevent contact with the body.

9. Regulatory Compliance Information

The following is a summary of regulations and guidelines that may pertain to 5CP (additional regulations and guidelines may apply):

- This product is subject to a Significant New Use Rule (SNUR). This SNUR restricts this product to use as a chemical intermediate.
- 5CP is regulated by the U.S. Department of Transportation (DOT).
- There are no established exposure levels for 5CP; however, OxyChem has established an Internal Occupational Exposure Level of 0.05 ppm recommended 8 hour Time-Weighted Average (TWA).

10. Sources for Additional Information:

OxyChem Product Material Safety Data Sheet web site: <http://msds.oxy.com/> (Search for HCC 240fa)

11. Contact Information: For additional information, call 1-800-752-5151 or 1-972-404-3700.

12. Preparation Date: December 2, 2009 **Revised:** February 19, 2013

This Product Stewardship Summary is intended to give general information about the product discussed above. It is not intended to provide an in-depth discussion of all health and safety information about the product or to replace any required regulatory communications.

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