

Product Stewardship Summary Dechlorane Plus

Summary

Dechlorane Plus is an odorless, white powder with the chemical formula, C₁₈H₁₂Cl₁₂. Dechlorane Plus is used primarily as a flame retardant in polymers to make products inherently safer.

1. Chemical Identity

Name: Dechlorane Plus

Synonyms: DechPlus; 1,2,3,4,7,8,9,10,13,13,14,14-dodecachloro-1,4,4a,5,6, 6a,7,10,10a,11,12, 12a- dodecahydro-1,4:7,10-dimethanodibenzo[a,e]cyclooctene

Chemical Abstracts Service (CAS) number: 13560-89-9

Chemical Formula: C₁₈H₁₂Cl₁₂

Molecular Weight: 653.70

Dechlorane Plus is a mixture of two structural isomers: syn and anti configurations. The commercial product is approximately 65% anti and 35% syn.

2. Production

Dechlorane Plus is made using a Diels-Alder reaction. The starting materials are hexachlorocyclopentadiene and cyclooctadiene.

OxyChem is a leading manufacturer of Dechlorane Plus. It is manufactured at OxyChem's facility in Niagara Falls, New York.

3. Uses

Dechlorane Plus is manufactured solely for industrial customers. After manufacture, Dechlorane Plus is shipped to our customers where the material is entrapped and immobilized into a polymer matrix. Dechlorane Plus is a flame retardant, and our customers use it in two primary applications in polymers -- nylon that incorporates DechPlus into electrical connectors and polyolefins that incorporates DechPlus into commercial wire and cable. The addition of DechPlus gives these polymers enhanced flame retardant properties that increase the safety of the products.

4. Physical and Chemical Properties

Dechlorane Plus is a white free flowing powder solid that is thermally stable to 285 °C, has essentially no solubility in water, and is only slightly soluble in some organic solvents. It has a very low vapor pressure. It is very chemically stable, and has an infinite shelf life if stored properly.

5. Health Effects

Inhalation

Based on animal studies, no health effects are expected. The only effect observed in a high-dose inhalation study using rats was an increase in liver weight.

Eye and Skin Contact

Dechlorane Plus is not irritating to the eyes and skin.

Ingestion

Based on animal studies, no effects from ingestion are expected.

Cancer Studies

No cancer studies have been completed using Dechlorane Plus; however, it has not been mutagenic in studies using animal cells.

Reproductive Studies

In a Reproduction and Developmental Toxicity Screening Study using rats, no reproductive or developmental effects were observed in any of the treated animals at any dose level. The no-observed-adverse-effect level was 5000 mg/kg, the highest dose examined.

6. Environmental Effects

No toxicity was observed in aquatic studies with Dechlorane Plus at dose levels up to 100 ppm.

Dechlorane Plus will agglomerate in water solutions and preferentially adsorb to sediments. Because the molecules tend to agglomerate in water solutions, the potential for uptake is reduced, and the potential for chronic toxicity is limited.

Dechlorane Plus is persistent in the environment. It is resistant to biodegradation by aerobic and anaerobic bacteria.

The determination of a bioconcentration factor is difficult due to the poor water solubility of Dechlorane Plus. Studies indicated that the bioconcentration potential in fish was low.

7. Exposure

The most likely ways exposures could occur are:

- Worker exposure – Inhalation and dermal exposure could occur in the manufacturing facility or in industrial facilities that use Dechlorane Plus. Good industrial hygiene practices and personal protective equipment minimize the risk of exposure.
- Consumer exposure – OxyChem does not sell Dechlorane Plus as a consumer product. Dechlorane Plus is incorporated into the polymers to improve the flame resistant properties of

the polymer and to improve safety of products. Incorporating Dechlorane Plus into the polymer makes it virtually immobile so the potential for exposure is remote. In addition, polymers incorporating Dechlorane Plus are used in products that are not typically handled directly by consumers.

- Releases – If a spill occurs, emergency personnel should wear protective equipment to minimize exposures.

8. Recommended Risk Management Measures

Prior to using Dechlorane Plus, carefully read and comprehend the Material Safety Data Sheet. The following are some recommended risk management measures:

- Work areas where Dechlorane Plus is used should have properly engineered dust control systems.
- To prevent inhalation contact, a properly fitting particulate mask should be worn.
- To prevent eye contact, protective eye wear such as safety glasses with side shields must be worn.
- To prevent skin contact, wear protective clothing suitable for dusts, including gloves.
- Proper labeling, handling and storage of Dechlorane Plus will reduce the likelihood of accidental exposure.
- Personnel using Dechlorane Plus in manufacturing operations should be properly trained.

9. Product Stewardship Programs

OxyChem provides bulletins to help Dechlorane Plus customers handle the product safely. In addition, OxyChem has sponsored studies of Dechlorane Plus under EPA's High Production Volume (HPV) Chemical Program.

10. Sources for Additional Information

HSDB, Hazardous Substances Databank Number: 7450, Last Revision Date: 20061220.

OxyChem Material Safety Data Sheet web site: <http://msds.oxy.com/>

RTECS, RTECS Number: IO1430000, Review Date: 199812.

US EPA, High Production Volume (HPV) Challenge, Robust Summaries and Test Plans,
<http://www.epa.gov/chemrtk/pubs/summaries/dechlorp/c15635tc.htm>

11. Contact Information: For additional information, call 1-800-752-5151, 1-972-404-3700 or 1-800-733-1165 option2.

12. Preparation Date: December 1, 2009

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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