Phenyl isocyanate

This document provides a brief description of phenyl isocyanate, its uses, and the potential hazards associated with short and long term exposure. Environmental impact information for accidental releases is included. This information is general in nature and is not intended as a replacement for the safety data sheet (SDS), product label and other safe handling literature. For additional information consult the LANXESS safety data sheet.

Identification

Product Name:	Phenyl isocyanate
Chemical Name:	Phenyl isocyanate
Synonym(s):	Isocyanatobenzene Isocyanic acid phenylester Phenylcarbimide
CAS Number:	103-71-9

Description

Overview: Phenyl isocyanate is a colorless to light yellow liquid at ambient temperatures. The chemical compound has a strong, pungent odor.

Uses: Phenyl isocyanate is sold by LANXESS primarily for use as a preservative (fungicide or biocide). The organic compound is also used as an intermediate in organic syntheses.

Properties:

Freezing Point:	-31°C (-23.8°F)
Boiling Point:	166°C (330.8°F)
Flash Point:	51°C (123.8°F)
Solubility in Water:	Decomposes

Potential Human Health Effects

Occupational Exposure

Potential for occupational exposure exists during manufacture, at unloading, storage and staging areas, and in reactor vessel charging operations where the chemical is used as an intermediate in the manufacture of other products. A much lower potential for exposure exists in facilities using phenyl isocyanate in closed manufacturing processes by trained personnel.

Employee Training

Workers handling phenyl isocyanate should be trained to implement proper handling procedures and to understand the potential health and physical hazards of this product. Respiratory protection must comply with the requirements set forth in OSHA's Respiratory Protection Standard (29 CFR 1910.134). When isocyanate vapor or mist is present, it is mandatory to use a full-face positive pressure, supplied-air respirator or a self-contained breathing apparatus (SCBA) if the recommended exposure limit is exceeded or airborne concentrations are unknown.

In addition, LANXESS recommends that goggles, permeation resistant clothing, gloves and foot protection be worn when handling phenyl isocyanate. A full-face shield should be worn in addition to goggles in operations where splashes may occur.

Material handlers should be included in a medical surveillance program. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used.

Consumer Exposure

LANXESS does not sell phenyl isocyanate to the general public.

Short-Term Health Effects

Phenyl isocyanate is corrosive to the skin, eyes, mucous membranes and digestive tract. Symptoms of dermal exposure may include redness, itching, swelling, pain, blisters and burns. Eye contact may result in redness, tearing, pain and burns.

Inhalation of phenyl isocyanate vapors or mist at concentrations above recommended exposure limits may result in respiratory tract irritation, burns, bronchitis, bronchial spasm, lung inflammation or pulmonary edema (fluid in the lungs). Symptoms of exposure may include sore throat, cough, runny nose, chest pain, shortness of breath and labored breathing. Persons with a preexisting, nonspecific bronchial hyperreactivity may experience the above symptoms, as well as asthma-like symptoms, at exposure levels well below recommended limits. Chemical or hypersensitivity pneumonitis, with flu-like symptoms (e.g., fever, chills), has also been reported.

Ingestion may result in abdominal pain, ulceration, shock or collapse.

Symptoms of exposure to phenyl isocyanate may be delayed. Pre-existing skin, eye and respiratory disorders may be aggravated by over-exposure to this product.

Long-Term Health Effects

Prolonged or repeated exposure to phenyl isocyanate may cause sensitization, severe burns, respiratory tract damage and/or reduced lung function. Once sensitized an allergic skin reaction may occur at very low levels of exposure, with symptoms including redness, swelling and rash. Some individuals may experience an asthmatic response that can be life threatening. Symptoms may include chest tightness, wheezing, coughing, shortness of breath and labored breathing. Persons showing symptoms of skin sensitization or asthma should avoid all further contact.

Physical Hazards

Phenyl isocyanate reacts violently with water. Avoid contact with strong oxidizing agents, strong acids, strong bases, alcohols and amines. Phenyl isocyanate is flammable, and explosive mixtures may form with air at temperatures above 51°C (123.8°F). Heating to decomposition may release hydrogen cyanide, nitrogen oxides and other potentially toxic fumes or gases. Avoid heat, open flames and other potential sources of ignition.

Potential Environmental Impact

Phenyl isocyanate degrades rapidly in the presence of moisture. An accidental release to water may pose a danger to fish (high toxicity), invertebrates (high toxicity) and aquatic plants (high toxicity) prior to degradation. The chemical is not expected to adsorb to suspended soils and sediments and is not expected to accumulate in the tissues of aquatic organisms.

Conclusion

Under normal conditions of anticipated use as described in this Product Safety Assessment, and if the recommended safe use and handling procedures are followed, phenyl isocyanate is not expected to pose a significant risk to human health or the environment.

References

International Chemical Safety Card, PHENYL ISOCYANATE, International Programme on Chemical Safety (IPCS)

IUCLID Dataset, Phenyl Isocyanate (103-71-9), European Chemicals Bureau, European Commission

Safety Data Sheet (SDS), Phenyl isocyanate, LANXESS Corporation

MedlinePlus Medical Encyclopedia, U.S. National Library of Medicine and the National Institutes of Health

ToxNet Hazardous Substance Data Bank, U.S. National Library of Medicine, National Institutes of Health and the U.S. Department of Health and Human Services

Contact Information

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Notices

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