

PHOSGENE CARBONYL CHLORIDE

Phosgene, or CG, is a highly reactive, chlorinated chemical compound. It is a colorless gas with the odor of newly mowed hay. A highly volatile chemical, phosgene primarily poses a vapor hazard to the eyes, throat and respiratory tract, particularly at temperatures above its boiling point of 46 degrees F. Phosgene vapor is approximately 3.4 times heavier than air.

Non-military uses

Industry widely uses phosgene for the synthesis of isocyanates, insecticides, resins and analine dyes. The United States manufactures, transports and stores more than 450,000 tons of phosgene each year. Our interstate highways and railroads move tank-car quantities of phosgene every day. The combustion or chemical degradation of materials such as foamed plastics, polyvinylchloride, paint strippers (methylene chloride) and other degreasing solvents also use phosgene.

Military uses

Germany first introduced phosgene to the chemical agent battlefield in Belgium December 19, 1915. Because of its tendency to dissipate rapidly, phosgene only proved effective when employed in large numbers of munitions with very high field concentrations. Weapons such as projectiles, mortars and bombs previously used phosgene, dispersing as a vapor or aerosol droplets that vaporized rapidly.

Health effects

Exposure to phosgene vapor may cause immediate, mild irritation of the eyes, nose, throat and respiratory tract. When the mild irritant effects subside, a symptom-free interval may occur, during which time the individual feels fine. However, within several hours after exposure to high concentrations of phosgene, the air sacs in the lungs begin to fill with fluid and the exposed individual starts complaining of chest tightness, coughing and increased shortness of breath. The individual may develop frothy secretions at the mouth with dramatic drops in blood pressure and “dry land drowning” in the lungs.

Human exposure data suggest that acute lung damage from phosgene exposure could result in the development of chronic bronchitis, asthma and emphysema, particularly if respiratory tract infections complicate recovery. However, no animal or human epidemiologic data exists to suggest that chronic phosgene exposure causes cancer in those exposed or in the occurrence of adverse developmental effects in the unborn fetus.

Environmental fate

Phosgene does not persist in surface water, groundwater or soil that contains moisture because of its rapid breakdown into carbon dioxide and hydrochloric acid. Phosgene does not persist in dry soil because of its tendency to evaporate readily.

Symptoms of phosgene poisoning

Mild irritation of eyes, nose, throat and respiratory tract which may subside

Chest tightness, coughing, increased shortness of breath may occur within several hours of exposure

Frothy mouth secretions

Dramatic blood-pressure drop

“Dry land drowning” in lungs

