



## HYDROGEN SULFIDE

- Agent information** Hydrogen sulfide (H<sub>2</sub>S) is produced naturally by decaying organic matter, by certain industrial processes, and may also be used as a chemical warfare agent. Synonyms include dihydrogen sulfide, sulfur hydride, sulfurated hydrogen, hydrosulfuric acid, “sewer gas”, “swamp gas”, hepatic acid, sour gas, and “stink damp.” Hydrogen sulfide is a colorless, highly flammable, and explosive gas. Hydrogen sulfide has a characteristic rotten-egg odor; however, olfactory fatigue may occur and may not provide adequate warning of hazardous concentrations. It is slightly heavier than air and may accumulate in enclosed, poorly ventilated, and low-lying areas. This chemical is toxicologically part of a group of compounds known as systemic asphyxiants.
- Route of exposure:** Inhalation is primary. Hydrogen sulfide is well absorbed through the lungs; cutaneous absorption is minimal. Exposure by any of these routes can cause systemic effects.
- Signs and symptoms:** Hydrogen sulfide is a mucous membrane and respiratory tract irritant; pulmonary edema, immediate or delayed, can occur after exposure to high concentrations. Breathing high levels of hydrogen sulfide can cause death within a few breaths, by way of respiratory arrest. Lower concentrations can result in eye irritation, sore throat and cough, shortness of breath, and fluid in the lungs. Symptoms of acute exposure include nausea, headaches, delirium, disturbed equilibrium, tremors, convulsions, and skin and eye irritation. Inhalation of high concentrations can produce extremely rapid unconsciousness and death. Exposure to the liquefied gas can cause frostbite injury.
- Protective measures:** Utilize appropriate Level Personal Protective Equipment (PPE) as identified by the Environmental Protection Agency and Hazmat protocols. Only those directly exposed to hydrogen sulfide are at risk. Persons exposed to hydrogen sulfide pose no serious risks of secondary contamination to personnel outside the hot zone and after decontamination.

**Emergency Medical Services and Preparedness Section**  
**24/7 Emergency Contact Number: 1-888-295-5156**  
**Contact Number: 302-223-2999**



**Prophylaxis:** N/A.

**Treatment:** Remove and double-bag contaminated clothing and flush exposed skin and hair with water for three to five minutes. Supportive care. Nitrite therapy (the cyanide antidote kit) has been suggested as a therapy for hydrogen sulfide exposure. Amyl nitrite is given by inhalation (for 30 seconds every minute until an intravenous line is established) followed by intravenous sodium nitrite (300 mg over absolutely no less than five minutes). It is not necessary to use the sodium thiosulfate. The antidotal efficacy of nitrite therapy is controversial but is currently recommended if it can be started shortly after exposure.

**Reporting:** Any suspect cases should be reported immediately to the Division of Public Health 1-888-295-5156 (24/7 coverage).

**Additional information:** For additional information, visit the CDC website at <https://www.atsdr.cdc.gov/>.