



HYDROGEN SULFIDE (H₂S)

Agent Information:

Hydrogen sulfide is a colorless, highly flammable and explosive gas with the potential to cause mass casualties. Hydrogen sulfide is naturally produced as organic matter decays; and by certain industrial processes. Hydrogen sulfide has a characteristic rotten-egg odor; however, olfactory fatigue may occur and may not provide adequate warning of hazardous concentrations. Hydrogen sulfide is slightly heavier than air and may accumulate in enclosed, poorly ventilated, and low-lying areas. It is also known as dihydrogen sulfide, sulfur hydride, sulfured hydrogen, hydrosulfuric acid, "sewer gas," "swamp gas," hepatic acid, sour gas, and "stink damp."

Signs and Symptoms:

Hydrogen sulfide is a mucous membrane and respiratory tract irritant. Immediate or delayed pulmonary edema occurs after exposure to high concentrations. Breathing high levels causes loss of consciousness after one or more breaths, and death within a few more breaths. 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, skin and eye irritation, and convulsions. Inhaling high concentrations can produce extremely rapid unconsciousness and death. Dermal exposure to the liquefied gas can cause frostbite injury.

Route of Exposure:

Inhalation. Hydrogen sulfide can be well absorbed through the lungs; cutaneous absorption is minimal. Exposure causes systemic effects.

Protective Measures:

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. Emergency department personnel should observe Standard Precautions.

Lab Samples Requested for Evaluation:

Hydrogen sulfide does not accumulate in the body. In case of life-threatening hydrogen sulfide poisoning, measuring blood sulfide or urinary thiosulfate levels may confirm exposure. Take samples within two hours of exposure. DPH will coordinate testing with CDC.

Prophylaxis:

Appropriate PPE to avoid secondary contamination.

Treatment:

Supportive care. Nitrite therapy (the cyanide antidote kit) is suggested. 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 5 minutes). It is not necessary to use the sodium thiosulfate. The controversial antidotal efficacy of nitrite therapy is recommended if started shortly after exposure.

Reporting:

Report suspect cases immediately to Delaware's Division of Public Health, Epidemiology Branch: 1-888-295-5156 (24/7 coverage).

Contact Information:

Delaware's Division of Public Health: 1-888-295-5156. For additional information, view the Centers for Disease Control and Prevention (CDC) website for Emergency Preparedness and Response at www.bt.cdc.gov.

24/7 Emergency Contact Number: 1-888-295-5156

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