



FACTS RELATING TO H2S

What is H2S?

Hydrogen Sulfide is a colorless, transparent gas with a characteristic of a rotten-egg odor at low concentrations and not detectable by odor at high concentrations.

Chemical symbol: H₂S

Specific Gravity: 1.192 (heavier than air)

Explosive limits: Lower: 4%, Upper: 44% volume in air

Ignition Temperature: 500o F

Solubility in water: 2.9 volumes of gas, per volume of water at 20o C

What are the effects?

This information excerpted from the American National Standards Institute standard: Z37.2-1972 Acceptable Concentrations of Hydrogen Sulfide.

Hydrogen Sulfide is an extremely toxic and irritating gas. Free hydrogen sulfide in the blood reduces its oxygen-carrying capacity, thereby depressing the nervous system. Hydrogen sulfide is oxidized quite rapidly to sulfates in the body, therefore no permanent aftereffects occur in cases of recovery from acute exposures unless oxygen deprivation of the nervous system is prolonged. There is no evidence that repeated exposures to hydrogen sulfide result in accumulative or systemic poisoning. Effects such as eye irritation, respiratory tract irritation, slow pulse rate, lassitude, digestive disturbances, and cold sweats may occur but these symptoms disappear in a relatively short time after removal from the exposure.

Odors become detectable in concentrations as low as .008 parts per million (ppm) (California studies) but the sense of smell is lost after 2-15 minutes at 100 ppm.

Physiological response:

10 ppm	Beginning eye irritation
50-100 ppm	Slight conjunctivitis and respiratory tract irritation after 1 hour exposure
100 ppm	Coughing, eye irritation, loss of sense of smell after 2-15 minutes. Altered respiration, pain in the eyes and drowsiness after 15-30 minutes followed by throat irritation after 1 hour. Several hours exposure results in gradual increase in severity of these symptoms and death may occur within the next 48 hours.
200-300 ppm	Marked conjunctivitis and respiratory tract irritation after 1 hour of exposure
500-700 ppm	Loss of consciousness and possibly death in 30 minutes to 1 hour.
700-1000 ppm	Rapid unconsciousness, cessation of respiration and death.
1000-2000 ppm	Unconsciousness at once, with early cessation of respiration and death in a few minutes. Death may occur even if individual is removed to fresh air at once.

To avoid discomfort, the (8 hour) time weighted average concentration of hydrogen sulfide shall not exceed 10 ppm.



How does H2S occur in oil and gas wells?

Hydrogen Sulfide is a naturally occurring gas mixed with natural gas or dissolved in the oil or brine and released upon exposure to atmospheric conditions. Storage tanks emit H2S when the water and hydrocarbons are separated and stored.

How is waste H2S gas disposed of?

Low concentrations of H2S can be removed from the gas stream at the well site. Fugitive emissions that can be contained can be treated and the H2S removed. Virtually any concentration of H2S can be removed from gas being emitted. Low volumes of free gas can be treated with an H2S removal agent found in the Impact H2S vent Gas Scrubbers.

What should I do if I smell H2S?

Never enter an area to see where the smell is coming from or to rescue downed personnel. H2S is extremely toxic in high concentrations.

Notify personnel who can address the problem as follows.

WHO CAN I CALL FOR HELP?

Emergencies:

If the problem appears that it may be more than just odors such as burning in your eyes or nose, immediately contact your local 911, fire or police department. Move away from any well or facilities near you by going perpendicular to the wind direction.