

Risks and Safety Hazards of Hydrogen Sulphide

What is Hydrogen Sulphide?

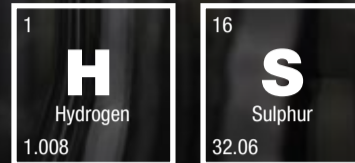
Chemical Compound: H₂S

CAS Number: 7783-06-4

Hydrogen sulfide is a colourless, poisonous gas with a sweet taste. It is often referred to by miners as 'stinkdamp' due to its pungent odour, resembling rotten eggs.

Other names: hydrogen sulfide, sulfane, Hydrosulfuric acid, Dihydrogen sulfide, Stink DAMP

Chemical Forms



Chemical Properties

Molecular weight:	34.08 g/mol
Boiling point:	-60.2°C
Melting point:	-84.5°C
Vapour pressure (20°C)	118.8 bar(a)
Relative density, gas (air=1)	1.2
Relative density, liquid (water=1)	0.92
Solubility in water	3980 mg/l
Gas Colour	colourless

Safety Hazards of Hydrogen Sulphide



Hydrogen sulphide is found naturally in crude petroleum, natural gas, volcanic gases, hot springs, and the breakdown of organic matter. As it is typically heavier than air, the gas tends to pool and stagnate in wells and poorly ventilated areas.



Hydrogen Sulfide is a highly flammable and explosive gas; flames can easily flashback to the source of a leak. H₂S can travel considerable distances, forming explosive mixtures in the air in the range of approximately 4.5 - 45%.

Flammable gases, Category 1



Risk of exposure can occur through:

- Accidental Release
- Leak
- Transportation



Hydrogen Sulfide can be measured using a gas detector fitted with *electrochemical sensors* or by using indicator stain tubes.

Health Risk: Hydrogen Sulphide Exposure Effects



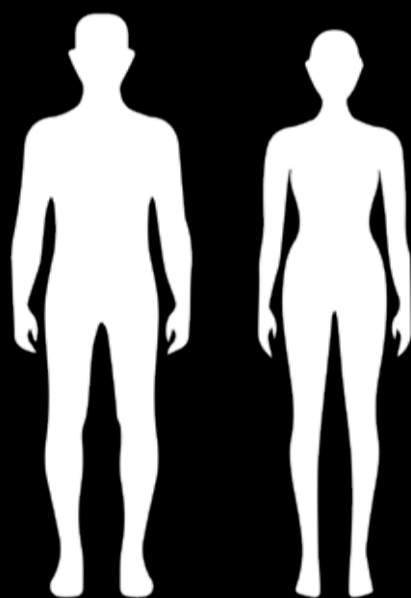
EYES

- Irritation
- Redness
- Conjunctivitis



STOMACH

- Nausea
- Loss of appetite



HEAD

- Loss of smell
- Dizziness
- Drowsiness



RESPIRATORY SYSTEM

- Tightness
- Difficulty breathing
- Fluid in lungs
- Burning

Working Exposure Limits of Hydrogen Sulphide

The eight-hour Time-Weighted Average (TWA) recommendations of Safe Work Australia:

1ppm

TWA concentration can result in irritation to workers.

Occupational Exposure Standards

	Excursion Limit
8 hr TWA	10 ppm (14 mg/m ³)
15 min STEL	15 ppm (21 mg/m ³)
PEAK	50 ppm (< 10 minutes)
OSHA General Industry Ceiling Limit	20ppm
OSHA Shipyard 8-hour limit	10 ppm
NIOSH IDLH	100 ppm

Dangers of Chemical Plumes

How long for hydrogen sulphide gas to dissipate? The duration and behaviour of a chemical plume are dependent on many factors. These include the volume released, ambient temperature, time of day, relative humidity, wind direction and speed, terrain, natural and urban barriers and environmental absorption factors such as dense and sparse foliage.

Hydrogen sulfide can be released into the air from underground spaces or through chemical reactions. It also can travel in trace amounts in larger chemical clouds. As the chemical plume behaves as if it is heavier-than-air, the risk of exposure to humans is greater compared to some other gases.