

# SAFETY MEMO

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Did you know?

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## What is Hydrogen Sulfide?

Hydrogen sulfide (H<sub>2</sub>S) is a dense, colourless gas produced during the natural decomposition of organic matter. It is a dangerous gas and is extremely toxic at high concentrations<sup>1</sup> and extremely flammable. It bears several names: dihydrogen sulfide, sulphur hydride, sulfurated hydrogen and hydrosulfuric acid.

At low concentrations, H<sub>2</sub>S has a distinctive smell of rotten eggs. However, odour is not a reliable indicator of hydrogen sulfide's presence. Workers can quickly get used to the smell of H<sub>2</sub>S and can no longer detect hazardous concentrations. This phenomenon, known as olfactory fatigue, occurs between 3 and 5 minutes at a level of 100 ppm.

## Why is it Hazardous?

H<sub>2</sub>S is slightly heavier than air. It is therefore especially dangerous in the low-lying areas, including confined or enclosed workspaces.

In areas where the gas can gather, H<sub>2</sub>S becomes immediately dangerous to life or health (IDLH) starting at a concentration of 100 ppm<sup>2</sup>.

Effets	Concentration (ppm)
Odour threshold	1
Sense of smell is blocked (3 to 5 minutes)	100
Irritation of eyes, nose, or throat resulting in coughing, headache, balance disorders, and other respiratory distress or arrest <sup>3</sup>	150-250
Deadly gas	300

Most exposures occur by inhalation. When inhaled, it goes through the lungs and enters the bloodstream. To protect itself, the body tries to break down the hydrogen sulfide as fast as possible to turn it into a harmless compound. Poisoning occurs when the amount absorbed in the blood exceeds the rate at which it is eliminated. Sub-acute exposure or exposure to lower levels can cause headaches, dizziness, loss of balance, agitation, nausea, and diarrhea. Repeated exposure to low levels or chronic poisoning can cause slow pulse rate, fatigue, insomnia, cold sweat, eye infection, loss of weight and skin eruptions.



## Are You at Risk?

H<sub>2</sub>S is found in large quantities in the petroleum refineries. However, in the food and pharmaceutical industries H<sub>2</sub>S is found in places such as:

- Sewage system.
- Wastewater treatment stations.
- Waste treatment plants.
- Septic and slurry tanks.
- Composting units.
- Residual egg processing used in vaccine manufacturing.

Confined spaces are particularly dangerous areas because they are prone to the rapid build up of hydrogen sulfide gas.

## Suggestions to Mitigate Risk

H<sub>2</sub>S control exposures may include<sup>4</sup>:

- Use exhaust and ventilation systems that are non-sparking, grounded, corrosion-resistant, explosion-proof, and separate from other exhaust ventilation systems.
- Train and educate workers about hazards and controls such as workplace practices and procedures, the emergency plans, locations of safety equipment, rescue techniques, first-aid, and confined space procedures.
- Use respiratory and other personal protective equipment such as eye protection and fire-resistant clothing.

<sup>1</sup> ACS Chemistry for Life. (July 6, 2015). Hydrogen sulfide. Retrieved from <https://www.acs.org/molecule-of-the-week/archive/h/hydrogen-sulfide.html>

<sup>2</sup> Canadian Union of Public Employees. (February 20, 2018). Hydrogen sulfide. Retrieved from <https://cupe.ca/hydrogen-sulfide#:~:text=H2S%20is%20slightly,starting%20at%20levels%20of%20100ppm>

<sup>3</sup> Agency for Toxic Substances and Disease Registry. (January 12, 2017). ToxFAQ™ for hydrogen sulfide. Retrieved from <https://www.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=388&toxid=67>

<sup>4</sup> United States of Department of Labor. (ND). Hydrogen sulfide. Retrieved from <https://www.osha.gov/hydrogen-sulfide/evaluating-controlling-exposure#:~:text=Use%20respiratory%20and%20other%20personal%20protective%20equipment,&text=Respiratory%20protection%20should%20be%20at,resp%20will%20provide%20eye%20protection>.