



GOALS

This safety session will teach trainees:

- To understand and identify the hazards of hydrogen sulfide
- How to protect themselves against these hazards
- The proper actions to take in case of such an emergency

Applicable Regulations: 29 CFR 1910.106, .119, .134, the Occupational Safety and Health Administration's (OSHA) Table Z-2 (29 CFR 1910.1000)



1. Hydrogen sulfide exposure creates a health hazard.

- Hydrogen sulfide is a gas, and its greatest health risks are from inhalation.
- Even small amounts can irritate the nose, throat, and respiratory tract and prolonged exposure can cause bronchitis or make respiratory conditions such as asthma worse.
- Some symptoms of short-term exposure to hydrogen sulfide can include nausea, dizziness, headaches, and, sometimes, loss of appetite and sleep.
- Exposure to high levels of this substance can cause muscle cramps, low blood pressure, slow respiration, and even loss of consciousness.
- Extremely high exposures can actually lead to paralysis and even death.
- While the greatest health risks come from inhaling the gas, prolonged exposure may also cause burns, itching skin, and burning eyes.
- If you should have direct skin contact with the gas in its liquefied form, there's also a risk of freeze burns.

2. Hydrogen sulfide is produced naturally from the decay of organic matter.

- As a result, swamps and sulfur hot springs may release hydrogen sulfide.
- Because it is heavier than air, it can build up in low-lying or enclosed, poorly ventilated confined spaces such as sewers.
- It is also a by-product of many industrial processes, including mining, hot asphalt paving, petroleum and natural gas refining, pulp and paper manufacturing, tanning, and sugar beet processing.
- It has a strong smell, like rotten eggs—unfortunately, that may not protect you because if you're exposed to it for a while, even in fairly low amounts, it paralyzes your ability to smell and identify it.
- OSHA's Z-2 Table sets the ceiling exposure limit at 20 parts per million (ppm), with up to 50 ppm for a 10-minute maximum if no other measurable exposure occurs.
- If its presence is detected, workers may be required to wear respiratory protection.

3. Hydrogen sulfide is also a physical hazard—in certain situations, it can burn or explode.

- If a process involves more than 1,500 pounds, it is covered by OSHA's regulation for process safety management of highly hazardous chemicals.



- It should never be used or stored where it could be exposed to heat, flames, sparks, or other ignition sources.
- Check that ventilation systems are working properly in areas where there's a risk of the presence of hydrogen sulfide gas.
- Processes that use hydrogen sulfide usually take place in closed systems to prevent the gases from getting into the air. If you're using such a system, be sure that the valve is closed when not in use.
- If you handle cylinders that contain hydrogen sulfide, avoid bumping and banging them. Inspect them regularly for leaks and report any problems you find immediately.
- Wear gloves and coveralls of rubber or neoprene construction if liquid contact could occur.
- Read labels and the safety data sheet (SDS) carefully for proper handling instructions.

4. Know the correct procedures in case of an emergency.

- If you smell hydrogen sulfide or experience possible symptoms of exposure such as headache or dizziness, get to fresh air immediately.
- More serious exposures may require medical attention.
- Someone having trouble breathing may require oxygen.
- If breathing stops, cardiopulmonary resuscitation (CPR) is required, followed by medical treatment.
- Medical attention is also necessary if hydrogen sulfide is swallowed.
- For a liquid splash you should:
 - Flush eyes, if splashed, with warm water immediately.
 - Remove contaminated clothing and flush skin with plenty of warm water.
 - Wash clothing thoroughly before reuse.
- Also, remember that hydrogen sulfide can explode, so in case of a fire you should evacuate the area immediately and alert others to get out.



DISCUSSION POINTS:

Review the ways in which you might be exposed to hydrogen sulfide in your workplace. Make sure your workers understand what procedures they should follow to protect themselves.



CONCLUSION:

Even though hydrogen sulfide is highly hazardous, it is possible to work safely around it if all safety precautions are followed.



TEST YOUR KNOWLEDGE:

Have your trainees take the Hazards of Hydrogen Sulfide quiz. By testing their knowledge, you can judge whether they understand dangers and how to protect themselves or whether they need to review this important topic again soon.



HAZARDS OF HYDROGEN SULFIDE QUIZ

- The greatest health risks of hydrogen sulfide are from inhalation.**
a. True b. False
- Extremely high exposures can actually lead to paralysis and even death.**
a. True b. False
- Hydrogen sulfide is lighter than air.**
a. True b. False
- Hydrogen sulfide is odorless.**
a. True b. False
- The Occupational Safety and Health Administration's (OSHA) process safety management standard covers a process that uses over 1,500 pounds of hydrogen sulfide.**
a. True b. False
- Hydrogen sulfide should never be used or stored where it could be exposed to heat, flames, sparks, or other ignition sources.**
a. True b. False
- If you smell hydrogen sulfide, you should get to fresh air immediately.**
a. True b. False
- You should wear gloves and coveralls of rubber or neoprene construction if liquid contact could occur.**
a. True b. False
- Hydrogen sulfide is flammable and can explode.**
a. True b. False
- OSHA does not set any exposure limits for hydrogen sulfide.**
a. True b. False

When you have completed this quiz, turn it in to your supervisor.

Name: _____

Date: _____



ANSWERS TO HAZARDS OF HYDROGEN SULFIDE QUIZ

1. a. True.
2. a. True.
3. b. False. Because hydrogen sulfide is heavier than air, it can build up in low-lying or enclosed, poorly ventilated confined spaces such as sewers.
4. b. False. Hydrogen sulfide has a strong smell, like rotten eggs—unfortunately, that may not protect you because if you're exposed to it for a while, even in fairly low amounts, it paralyzes your ability to smell and identify it.
5. a. True.
6. a. True.
7. a. True.
8. a. True.
9. a. True.
10. b. False. OSHA's Z-2 Table sets the ceiling exposure limit at 20 parts per million (ppm), with up to 50 ppm for a 10-minute maximum.