Tool Box Talk

Hydrogen Sulphide (H2S)

Overview

Hydrogen Sulphide (H2S) is a colourless, extremely flammable, compressed gas. Common names for it include sewer gas, swamp gas and manure gas. Crude petroleum, natural gas and hot springs are some of the places it occurs naturally.

It can also be produced by the breakdown of bacteria from human and animal wastes (e.g. sewage) as well as industrial activities, including petroleum/natural gas drilling and refining, wastewater treatment, agriculture silos and pits, food processing, hot asphalt paving, mining and during excavation work on a construction site. When agitated, depressurized or heated, H2S can be released from liquids.

H2S may explode if heated. Ignition and flashback from a distance are possible. It can accumulate in hazardous amounts in low-lying areas — especially inside confined spaces — as it is slightly heavier than air and may travel along the ground and collect in areas that are low-lying, enclosed and not well-ventilated.

Exposure

H2S is very toxic and fatal if inhaled. It is both an irritant and a chemical asphyxiant that affects the central nervous system. In low concentrations, at initial contact, it can smell like rotten eggs and can irritate the eyes, nose, throat and respiratory system (e.g. burning/tearing of eyes, cough, shortness of breath).

Moderate concentrations can cause more severe eye and respiratory irritation, including coughing, difficulty breathing and fluid in the lungs. High concentrations can cause shock, convulsions, inability to breathe, extremely rapid unconsciousness, coma and death.

Protection

For safe handling procedures, a hydrogen sulphide Safety Data Sheet (SDS) should be consulted. Hazard exposure can be reduced with the proper training, practices, procedures, controls, hazard assessments and emergency procedures.

Additionally, workers should be trained in the use of electronic and/or tube monitors, fit tested for either a full-face, positive-pressure self-contained breathing apparatus (SCBA) or a full-face, positive-pressure supplied air breathing apparatus (SABA) equipped with a minimum of a 5-minute escape air bottle and full body hazmat suits.

Legislation

Saskatchewan H2S legislation can be found in *The Occupational Health and Safety Regulations, 2020* in Part 21 Chemical and Biological Substances, PART 29 Oil and Gas Section 29-3(2)(d), Section 29- 30(e)(f)(g); and Table 18 Contamination Limits (see below).

In Saskatchewan, the Occupational Exposure Limit (OEL) is an average of eight hours if the average contamination limit is 10 parts per million (ppm) and the 15-minute limit is 15 ppm.

Every employer whose workforce might come into contact with Hydrogen Sulphide must comply with any regulations that apply. They must also maintain a watching brief on these issues concerning exposure values permitted for their workers.

CAS* Number	Substance	8-hour average contamination limit mg/m* or ppm*	15-minute average contamination limit mg/m or ppm
7783-06-4	Hydrogen sulphide	10 ppm	15 ppm

*mg/m3 - milligrams of substance per cubic metre of air; ppm - parts(volume) of substance per million parts (volume) of air

*CAS means the Chemical Abstracts Service Division of the American Chemical Society.