BCEHS | BC Emergency Health Services

Paramedic Specialist

Chemical Response Data Sheet

H2S 2018 1.0

Chemical Name: Hydrogen Sulfide (H2S)

Identifying Data: UN # 1053 CAS # 7783-06-4
Classification: Poison gas

Placard **NFPA Rating**

WHMIS 2015 Symbols

Physical Properties:

Colour	Colorless
Odor	Rotten eggs. Odor threshold (less than 10ppm)
Vapor Density	1.18 (Heavier then air)
Solubility	2.7% @20C (slight)
Boiling Point	-60C (liquid state)
Vapour Pressure	20 atm. 15,200 mmHg @25 C (approx.) >40mmHg = Inhalation risk
IP	10.46 ev

General Description:
Colour less gas with strong odor of rotten eggs. More commonly found as by product or process or decomposition of wastes. Rarely found in transport. May be generated by mixing of some household products by accident, or intentional.

Commonly found locations: (In varying concentrations)

- NG gas sites
- Chemical refinery
- Land fills
- Pulp/Paper mills
- Waste water treatment
- Hot springs
- Gas plants
- Sewer systems
- Manure tanks
- Chemical Suicide attempts (acid mixed with sulfur containing chemicals)

Work Safe BC Permissible Limits

TWA N/G STEL/Ceiling 10ppm IDLH 100pm (SCBA must be worn)

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Emergency Procedures to Consider for Paramedic Specialist

- Do initial Size-up of incident.
- Evacuate immediate area and consider further evacuation as situation dictates. **See ERG evacuation distance recommendations.**
- Recommend eliminating all ignition sources if safe to do so from remote locations.
- H2S is a highly flammable gas with wide flammable limits.
- Recommend SCBA teams of two with gas monitoring equipment to investigate.
- Consider PPE with SCBA for immediate emergency rescue for viable patients. Decon patients and DO NOT remove SCBA until rescuer has been thru Decon in order to prevent inhalation injury.
- Provide Shelter in Place Instructions if requested:
  * Stay indoors (unless evacuation has been called by local authorities)
  * Close all windows and doors, seal with duct tape or wet towels
  * Shut off furnace, exhaust fans, fireplaces, and air conditioners
  * Wait for and follow advice from local police or authorities.
  * If the smell is very strong, breathe through a wet cloth and turn on any nearby showers to absorb airborne vapor

ERG 2016 Recommended Evacuation

Small Spills < 200L		
Isolate in all Directions	Protect Down wind	
	Day	Night
30M	0.1km	0.4km

Large Spills >200 L		
First Isolate	Then Protect Downwind (KM)	
	Day	Night
400M	2.1	5.4

(See also)

TDG Reference: TIH/Guide 117

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Emergency Decontamination:

- Decon of skin not usually required unless liquid involved or skin symptomatic.
- **Have patient self-Decon with direction as needed from safe distance.** Assist removing clothing if needed with appropriate PPE to prevent secondary contamination and injury.
- Use water for decontamination. Large volume/low pressure. Tepid if Immediately available.
- Eyes take precedence.
- Goal is to begin Decon within 1 minute of contact if possible (Time = Tissue).
- Ensure patient is fully decontaminated. Do not forget skinfolds, armpits, groin, buttocks and feet.
- Do not cause hypothermia. Focus on symptomatic areas (pain, visible burns).
- No concerns of off gassing via inhalation or digestive tract.
- See Pre-Hospital Care below for further information

Fire and Reactivity: Flammable

- Flash point: N/A
- LEL 4 % (40,000ppm)
- UEL 46% (460,000ppm)
- Auto-ignition temp. 260C
- Will emit toxic Sulfur Dioxide when combusting.

PPE

- SCBA Turnout Gear/Coveralls for Emergency rescue and removal of viable victims or for quick isolation of valve.
- Recommend use of wind direction, water fog etc. to protect responders.
- Level A Protection compatible with H2S to be worn for all leaks that do not require immediate medical intervention.
- Respiratory protection; **SCBA recommended at all times**.
- Acid resistant Gloves/Boots. Utilize chemical compatibility charts for permeation and degradation times to determine optimum PPE protection to be worn.
- Consider utilizing Level A, B Clothing (PPC) in higher or IDLH concentrations to prevent frostbite/corrosive burns to skin.

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Toxidrome: Irritant gas/Systemic Asphyxiant Symptoms may include; Burning eyes, throat & skin. Cough, chest tightness, with increased heart rate and respiratory rate. Syncope and collapse may occur if exposed to high concentrations.

Primary route of exposure: Inhalation

Primary Targets of Toxicity: Lungs, CNS, eyes, skin at high concentrations

- Eyes (irritation, "gas eye") at low concentrations.
- Airway and Breathing; caused by corrosive local toxic effects on mucous membranes of upper and lower airways.
- H2S also absorbed thru skin.
- Odor threshold: "rotten eggs" at less than 1ppm.
- Loss of smell at approx. 50-100ppm (IDLH)
- **CNS: Headache, drowsiness, "knockdown" may occur at concentrations above 500 ppm.**
- **Immediate Knockdown may occur with concentrations above 700ppm and may be fatal.**
- Any Cardiovascular (Tachycardia, Bradycardia, hypotension) and/or Neurologic symptoms confusion/DLOC/seizures) may be secondary due to cellular hypoxia.

Pre -Hospital Care:

- Remove victim from hazardous area utilizing appropriate PPE for hazard.
- Remove all contaminated clothing from victim(s)
- Flush eyes with tepid water for 15-20 minutes as per training.
- Decontaminate skin with soap and water for 15- 20 minutes. (Do not delay transport to medical aid)
- Apply High flow 02 with NRB. Assist ventilations with BVM /intubation as required.
- Treat patient following support of ABC's as per training.
- Any Cardiovascular (Tachycardia, Bradycardia, hypotension) and/or Neurologic symptoms (confusion/DLOC/seizures) may be primary CNS effects or secondary due to hypoxia.
- Exposed patients with underlying lung disease (Asthma, COPD) may become symptomatic at lower concentrations then healthy individuals. Utilize their prescribed inhalers as required.
- Contact BC Poison Control at 1-800-567-8911 or 604-682-5050 for Physician advisement on patient care. Possible antidote may be available (ex. Amyl nitrate)

References:

WISER (Wireless Information System for Emergency Responders)

AHLS Provider Manual/4th edition.

https://www.ccohs.ca

WorkSafe BC/Exposure Limits

Canutec ERG 2016