BCEHS | BC Emergency Health Services

Paramedic Specialist

Propane 2018 1.0

Chemical Response Data Sheet

Chemical Name: Propane (C3H8)

Identifying Data: UN # 1075
UN # 1978

CAS # 74-98-6

Classification: 2.1 Flammable Gas
WHMIS 2015 Symbols

Placard

NFPA Rating

Physical Properties:

Colour	Colorless
Odour	Odorless (skunky if mixed with mercaptan)
Flammable Range	2.1% - 9.5% (21.000ppm – 95,0000ppm)
Auto Ignition Temp	470 C
Solubility	Poor (6.1% by volume @ 7.8 C)
Boiling Point	-42 C (May cause frost bite)
Expansion Ratio	270 to 1
Vapour Pressure	7150 mmHg (High)
Vapor Density	1.52 (Air =1) (Heavier than air)

General Description:
Colourless gas with mercaptan odour. Shipped under pressure. Contact with liquid leak may cause frost bit. **Explosive gas** that is heavier then air.

Commonly Found Locations:

- In transport
- In homes (stored in small or large tanks)
- Pipelines
- Powers vehicles such as Zamboni's, cars, buses, forklifts
- RV's and other recreational vehicles as refrigerant and for fuel.
- Industry- glass making, poultry farms, grain dryers
- Hot air balloons
- Used as propellant for many household aerosol sprays such as shaving cream etc.
- Propane tanks have been used in terrorist activity as IED's

Work Safe BC Permissible Limits:

8 hr TWA 1000 ppm **15min STEL/Ceiling** – not established **IDLH** 2100 ppm

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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 evacuation distances below.
- Leaks with no fire involved present the risk of a possible Vapour Cloud Explosion (VCE) should the vapour find an ignition source within its flammable limits.
- Advise to eliminate/isolate ignition sources from remote areas. (MCC/remote inline disconnects)
- Advise to have operators shut off pumps, and isolate pipe and tank valves etc., from remote locations if possible.
- Do not extinguish fire unless flow can be stopped. If not able to shut off supply, let fire burn itself out.
- Cool all affected containers with flooding quantities of water from distance with appropriate PPE. Risk vs benefit decision.

ERG 2016 Recommended Evacuation Distances

- Immediate initial Evacuation distance of 100M
- Consider initial downwind evacuation of 800M

Fire Involved Tanks (BLEVE)*** precaution.

Immediately Isolate for 1600M in all directions.

Preferred Evacuation Distances

Tank Capacity	
100L	300M
400L	500M
2000L	850M
4000L	1000M
8000L	1300M
22000L	1800M
22000L to 140000L	2200M

****BLEVE: Boiling Liquid Vapour Explosion.*

See ERG Guide 115. Additional information on pages 368 and 369 for BLEVE.

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Emergency Decontamination:

- Decon is not required unless liquid release on patient.
- Have patient self-Decon from safe distance if able. Assist removing clothing if required wearing appropriate PPE for task.
- Remove and double bag clothing if mercaptan odor is present.
- Irrigate exposed eyes with water for 15 minutes.
- Remove any wet clothing.

PPE

- Wear appropriate protective clothing to prevent skin freezing – gloves, goggles/face shield.
- Wear appropriate eye protection to prevent eye contact with liquid. Could result in burns or tissue damage from frostbite.
- SCBA over 2100ppm (10% of LEL) NIOSH recommends suppled air respirators for levels below 2100ppm.

Fire and Reactivity:

- Flash point N/A (gas)
- LEL 2.1% (21,000 ppm)
- UEL 9.5% (95,000 ppm)
- Auto ignition temperature 470C
- **Extreme flammable gas**.
- Forms explosive mixtures with air and oxidizing agents.
- **Fire involved vessels may BLEVE.**
- Vessels with relief valves cycling do not indicate it is safe. Vessel may BLEVE while relief valves are open or closed the latter may indicate faulty relief valve.
- **Do not extinguish flames** due to possibility of explosive re-ignition (VCE).
- Vapours can be ignited by ignition sources such as static electricity, pilot lights, heaters etc.
- Keep fire involved containers cooled with water spray from distance.

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Toxidrome: Simple Asphyxiant

Symptoms may include signs of hypoxia; lightheaded, confusion, tachycardia, tachypnea.
Primary route of exposure: Inhalation

Primary Targets of Toxicity: CNS, Respiratory, Cardiac.

- Initial euphoria due to hypoxemia may impair the patient's ability to escape from toxic environment.
- Concentrations of 100,000 ppm (10%) have produced slight dizziness in human subjects with slight irritation to eyes, nose and respiratory tract.
- It would take a concentration of propane of 250,000ppm to lower the concentration of oxygen to 16% in a confined space. 16% 02 is the approximate concentration of oxygen where symptoms of hypoxia will likely begin to manifest.
- Frost bite potential if exposed skin near point of release due to propane's low boiling point (-42C).

Pre - Hospital Care:

- Simple Asphyxiant
- Remove victim from hazardous area utilizing appropriate PPE for hazard.
- Symptomatic patients require prompt transport to Medical Aid while supporting ABC's as per training. Support airway, provide 100% oxygen via non-rebreather, treat seizures and hypotension. Utilize cardiac monitor when available.
- In the event eyes are frozen closed. Flush with water first before attempting to open eye lids.

References and Links:

WISER (Wireless Information System for Emergency Responders)

2008 Emergency Response Guidebook

WorkSafe BC/Exposure Limits

Https://www.superior.com/sds/

https:www.cdc.gov/niosh