

Chemical Suicide Overview



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Special Operations Section
Des Moines Fire Department

TECHNIQUES

- Poisoning accounts for about 15% of suicides annually
- Hydrogen Sulfide
- Hydrogen Cyanide
- Phosphine
- Carbon Monoxide
- Inert Gases

HYDROGEN CYANIDE

- 2 approaches with the same result
- Ingestion: person ingest metal cyanide and it reacts with stomach acid to produce HCN
- Mixes metal cyanide with acid in bucket

Hydrogen Cyanide
 $\text{HCl} + \text{NaCN} \rightarrow \text{HCN} + \text{NaCl}$
 PEL 10 ppm IDLH 50 ppm LC₅₀ (5 min) 200 ppm
 Flammable Range 5.6% - 40%

PHOSPHINE

- Aluminum Phosphide ingest that reacts with water in the stomach to produce phosphine

Phosphine
 $\text{AlP} + \text{H}_2\text{O} \rightarrow \text{PH}_3 + \text{Al(OH)}_3$
 PEL 0.3 ppm IDLH 50 ppm LC₅₀ (5 min) 1000 ppm
 Flammable Range 1.6% - 98%

CARBON MONOXIDE

- The Car
- Can be created by mixing formic acid and sulfuric as described in the "peaceful Pill Handbook" and "The Complete Manual of Suicide"

Carbon Monoxide
 $\text{CH}_2\text{O}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{HCO} + \text{H}_2\text{O} + \text{H}^+ + \text{SO}_4^{2-}$
 PEL 50 ppm IDLH 400 ppm LC₅₀ (5 min) 5000 ppm
 Flammable Range 12.5% - 74%

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LOW	0 - 10 ppm	Irritation of the eyes, nose, and throat
MOD	10 - 50 ppm	Headache Dizziness Nausea and vomiting Coughing and breathing difficulty
HIGH	50 - 200 ppm	Severe respiratory tract irritation Eye irritation / acute conjunctivitis Shock and convulsions Coma Death in severe cases

At 500+ ppm breaths can cause immediate death

Chemical Appendix

Mixing common household items can produce a variety of toxic fumes:

Column A	Column B	Column C	Column D
Sodium Hypochlorite containing products	Acid containing products	Ammonia containing products	Sulfur containing products
Bleach Disinfectants All purpose cleaners Mold and mildew remover Deck washing products Pool chemicals	Vinegar Window cleaner Toilet bowl cleaner Concrete, tile, or stone cleaners Drain cleaners	Window cleaner Cleaning products All purpose cleaner Fertilizers	Dandelion dypoams Pesticides Sparkling water Some paints Fungicides Bath salts Lawn and gardening chemicals Fertilizers


Mixing column A with B can produce chlorine gas (pungent, irritating odor)

Mixing column A with C can produce chloramines (pungent odor)

Mixing column B with D can produce hydrogen sulfide (rotten like rotten eggs or burnt matches) causes olfactory fatigue (temporary inability to smell the gas after exposure)

Continued


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Hydrogen Chloride + Calcium Polysulfide
= Hydrogen Sulfide Gas

Hydrogen Sulfide	
MSDs + 2HCl → H ₂ S + HCl ₂	
PEL 10 ppm	IDLH 100 ppm LC ₅₀ (5 min) 800 ppm
Flammable Range 4% - 45%	

The Call to Dispatch



Law Enforcement Dispatched to Incident



Des Moines Fire Department dispatched to incident





The Scene



The scene set up for processing by
DMPD Identification Unit



Driver's door open – other 3 doors locked



The Note
"Be Careful Call Haz Mat Dangerous Gas"



Front passenger seat



Front driver's window



Note multiple bottles of chemicals

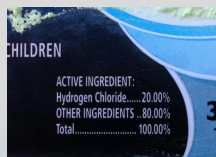




Extrication Engine removed "B Post" to facilitate removing victim from the vehicle

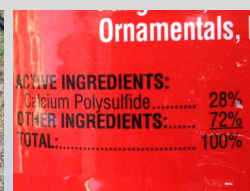


The Chemicals



Active Ingredient: Hydrogen Chloride 20%

The Chemicals



Active Ingredient: Calcium Polysulfide 28%

Hydrogen Sulfide (H₂S)

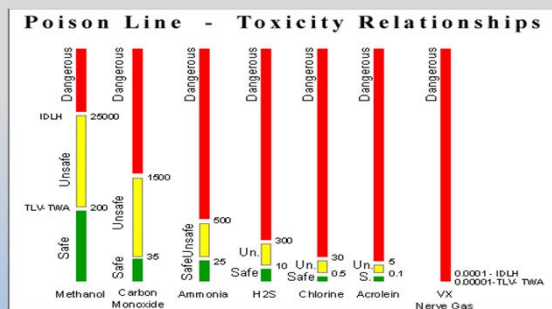
Hydrogen sulfide is a colorless, extremely hazardous gas with a strong "rotten egg" smell.

It is an irritant and chemical asphyxiant that effects both oxygen utilization and the central nervous system.

Low concentrations irritate the eyes, nose, throat, respiratory system.

Sense of smell becomes rapidly fatigued & CAN NOT be relied upon to warn of a continuous presence of the gas.

Safe, Unsafe and Dangerous



Hydrogen Sulfide (H₂S)

High concentrations can cause shock, convulsions, inability to breathe, extremely rapid unconsciousness, coma and death. **Effects can occur within a few breaths, and possibly a single breath.**

Hydrogen Sulfide IDLH – 100 parts per million
IDLH (Immediately Dangerous to Life & Health) values are based on the effects that might occur as a consequence of a 30 minute exposure

Some chemical suicide tests involving Hydrogen Sulfide gas have produced levels greater than 8,000 parts per million

1 min after mixing = 1000 ppm

Peak at 5 minutes =8,500 ppm

.0047 ppm	Detect odor
50-100 ppm	Eye damage
150-250 ppm	Sense of smell no longer works
320-530 ppm	Fluid in lungs "chemical pneumonia"
530-1000 ppm	"Panic breathing" and breathing stops
800 ppm	50% fatal after 5 minutes
1000 ppm	Certain Death

DECON

- Hydrogen sulfide, hydrogen cyanide, phosphine, and carbon monoxide have been determined to not be skin hazards at the concentrations up to, and including, lethal concentrations; therefore, firefighter protective gear is suitable for skin protection.
- Fresh Air Decontamination can be performed through natural ventilation or forced ventilation. If the toxic or corrosive liquids/solids come into contact with a person or the toxic reagents have been vomited, wet decontamination approaches are warranted.