



## (U//FOUO) Chemical Suicide Awareness Bulletin

**Safety Notice:** A recent chemical suicide in White Bear Lake reinforces the importance of reviewing the following information with all first responders.

"Detergent Suicide" or "Chemical Suicide" started as a phenomenon in Japan around 2008 when over 500 people committed chemical suicide that year alone. Since then, access to information via the internet on how to commit this act has caused this to become a worldwide problem. Online instructions show people a list of products they can easily obtain from nursery, grocery or home improvement stores and how to mix those chemicals. The preferred compounds are hydrogen sulfide and hydrogen cyanide. In Minnesota, there have been over a dozen instances of chemical suicide dating back to 2012.

### (U//FOUO) Chemical Suicide/Attempts in Minnesota

(U//FOUO) On 01 May 2018, a 19-year-old man was found deceased in a White Bear Lake parking lot with a sign on the window that said "Danger Hydrogen Cyanide."<sup>1</sup>

(U//FOUO) On 12 February 2017, a Rochester woman was taken to a local hospital after reports of a suicidal person led first responders to find the woman had mixed toxic chemicals inside a vehicle in an attempt to take her own life. Her condition was not available.<sup>2</sup>

(U//FOUO) On 20 April 2016, a Cottage Grove teenager attempted to commit suicide by mixing chemicals. He was taken to a local hospital and treated for chemical inhalation.<sup>3</sup>

(U//FOUO) On 22 February 2016, a man was found dead in his car in Eagan. Law enforcement did not locate a note, so the exact circumstances remain unknown. However, a charcoal grill was left smoldering in the backseat, leading to a Carbon Monoxide (CO) caused death.

(U//FOUO) On 28 October 2015, a man was found deceased in the Robbinsdale City Hall parking lot. There was a tank of helium found next to the deceased man, along with a suicide note<sup>4</sup>

(U//FOUO) On 23 September 2015, a man was found deceased in Golden Valley. Prior to his death, he posted a note that stated "don't open the doors, explosion." A burning portable grill in the backseat was the source of his Carbon Monoxide death.

(U//FOUO) On 29 January 2015, a man was found deceased at the Avon rest area after putting a bag over his head and turning on multiple helium tanks.

Continued

(U//FOUO) On 09 January 2013, a man mixed multiple chemicals in his car at a rest stop in Sturgeon Lake, which killed him. A note was left on the front window that said “HAZMAT.” The amount of chemicals mixed was so much that it overflowed and leaked from the car onto the pavement. Several first responders were treated and released after being exposed to the material.<sup>5</sup>

(U//FOUO) On 29 April 2012, Washington County First Responders arrived in Denmark Township after reports of a “slumper” came in. Responders discovered a deceased male occupying a vehicle that contained; Sunnyside Muriatic Acid, The Works Drain Cleaner, Tide Laundry Detergent, Bonide Fruit Spray, and Hi-Yield Lime Sulfur Spray. The 42-year-old Prescott, Wisconsin man left a suicide note, but no warning that a chemical suicide had taken place.<sup>6</sup>

(U//FOUO) Most Common Chemicals Used

(U//FOUO) Chemical suicide refers to the process of mixing chemicals in an enclosed space to deliberately create a hazardous gas that fills the space and results in an individual’s death. People often use vehicles or smaller rooms that restrict the hazardous gas from dissipating. Multiple types of chemicals can be used to create different gases, including:<sup>7</sup>

(U//FOUO) **Hydrogen Sulfide** (H<sub>2</sub>S) can be produced by mixing toilet bowl cleaner with a sulfur source, such as the popularly-used (Bonide Lime Sulfur Spray “purple cap”).

(U//FOUO) **Sodium Cyanide** (NaCN) and **Potassium Cyanide** (KCN), known as cyanide salts, are commonly used in the extraction of silver and gold from ores, fumigation, and chemical manufacturing. When exposed to the acid in an individual’s stomach, the salts produce hydrogen cyanide gas.

(U//FOUO) **Hydrogen Cyanide** (HCN) can be produced by mixing hydrochloric acid with compounds containing cyanide, such as potassium cyanide and sodium cyanide.

(U//FOUO) **Carbon Monoxide** (CO) can be produced by mixing formic acid and sulfuric acid. It is also a byproduct of combustion engines and comes out of exhaust pipes.

(U//FOUO) **Sodium Azide** (NaN<sub>3</sub>) is a solid chemical used at hospitals, laboratories, farms, and in airbags. Sodium Azide produces a hazardous gas when combined with water, acids, or solid metals.

(U//FOUO) **Aluminum Phosphide** (AIP) is a solid chemical used in pesticides. When exposed to liquid, Aluminum Phosphide generates a hazardous phosphine gas.

(U//FOUO) **Helium** (He) and **Nitrogen** (N) gases are colorless, odorless, tasteless, unreactive gases that when encountered in concentrated doses, can displace oxygen and lead to death.



**(U//FOUO) Chemical Suicide Study<sup>9</sup>****(U//FOUO) Abstract:**

In 2014, the San Diego Hazardous Incident Response Team (HIRT) conducted a chemical study to determine the risk to the public and first responders in the event of a chemical suicide. This study, a simulated Hydrogen Sulfide suicide, was designed to answer the following questions:<sup>9</sup>

1. Hydrogen sulfide is a flammable gas, but can it reach the lower explosive (LEL) limit with different volumes of reactants?

Answer: No, not observed in this study. Through all the testing with different volumes of reactants the hydrogen sulfide gas did not reach flammable limits inside a standard sedan. The highest LEL% was 38.5%.

2. How fast can Hydrogen Sulfide reach lethal levels, and how long will it remain in a sedan?

Answer: According to our data, lethal levels could be reached in as little as 4 minutes after mixing and can remain at this lethal level for up to 30 minutes.

3. What are the consequences when a first responder or a Good Samaritan approaches or opens a door to assist a chemical suicide victim?

Answer: The results are potentially lethal if the door is opened within 30 minutes of mixing the reactants.

4. How far will the Hydrogen Sulfide gas travel once the door is opened?

Answer: According to the study, it has the potential to travel up to 75 feet. This data suggests a perimeter of 150 feet to be sufficient.

5. How long does it take to vent the gas to safe levels once the doors are opened?

Answer: With lethal levels of hydrogen sulfide gas remaining inside the sedan, the Hydrogen Sulfide gas will vent to zero parts per million within 15 minutes.

6. What is the best personal protective equipment (PPE) to use?

Answer: In our study, the hydrogen sulfide gas does not concentrate enough to reach flammable limits inside a sedan. There may be other situations with different volumes of reactants and smaller spaces where this may occur. Therefore, it is recommended that fire fighter turnouts still be the PPE of choice to conduct a reconnaissance of the vehicle.

After the vehicle is vented, the personal protective clothing should be changed to splash protection "Level B" to keep the responder from contaminating the firefighter turnouts during neutralization. This study determined that there is no flammability potential during this activity.

Continued

7. Is the remaining chemical mixture still a hazard to first responders?

Answer: Yes. When the bucket is relocated for neutralization, there is more hydrogen sulfide gas generated at almost lethal levels, ~800 ppm. Respiratory protection is required, such as a self-contained breathing apparatus with level “B” personal protective equipment.

8. Will the bagged bodies be a hazard to the Medical Examiner staff?

Answer: The simulated mannequins with clothing used in the study were bagged after each test and stored for 24 hours. They were monitored after 24 hours and the levels detected were safe for medical staff to proceed with their duties.

9. Is the remaining chemical mixture still a hazardous waste once neutralized?

Answer: It depends on the neutralization method: Yes, if the mixture is neutralized with soda ash, the neutralized mixture is still considered a hazardous waste as it fails toxicity and reactivity testing. No, if the mixture is neutralized with fast set concrete it is NOT CONSIDERED a CA HAZARDOUS WASTE as it passes the toxicity (fish bioassay test) and reactivity testing. This mixture can be disposed of as solid waste, saving a considerable amount of resources that are normally provided from State of California to dispose of the hazardous waste.

### (U//FOUO) Study Lessons Learned

- Secure a perimeter of 150 feet
- Use fire fighter turnouts for reconnaissance and monitoring of the vehicle
  - Look for secondary devices
  - Look for yellow liquids and containers inside the vehicle
- The vehicle will not be at flammable limits and cannot catch fire
- Use the combustible gas indicator for perimeter monitoring and the photo ionization detector for monitoring cracks and crevices of the vehicle for higher concentrations.
- The vehicle can be vented with a 150' perimeter and the gas will dissipate in 15 minutes
- Once vented, ensure the medical examiner provides approval to remove the chemical containers.
- Moving the mixing bucket can cause lethal levels of hydrogen sulfide gas to be generated and should be handled in full Level “B” chemical protective clothing
- Neutralizing with fast setting concrete will allow the agency to treat the solidified waste as a non-hazardous waste

Distance from Car	Hydrogen Sulfide Gas Concentration
0-25 Feet	660 ppm
25 Feet	250 ppm
50 Feet	50 ppm
75 Feet	< 10 ppm
100 Feet	0 ppm

Continued

## Exposure Symptoms

<b>LOW</b>	0 – 10 ppm	Irritation of the eyes, nose, and throat
<b>MOD</b>	10 – 50 ppm	Headache Dizziness Nausea and vomiting Coughing and breathing difficulty
<b>HIGH</b>	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 Paints	Dandruff shampoos Pesticides Spackling paste 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 (unpleasant odor)

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

Continued



## INDICATORS OF A CHEMICAL SUICIDE<sup>10</sup>

### Unresponsive Person in a Vehicle

When a citizen calls 911 to request medical assistance for a person that is unconscious or "sleeping" inside of a vehicle, it is important to ask questions about the scene to determine if the incident is a possible chemical suicide. It is critical that the caller and citizens stay clear from the vehicle if it meets any of the following criteria:

- ☐ Warning sign(s) taped to the vehicle door or placed inside
  - May indicate HAZMAT or SUICIDE
  - Note: not all chemical suicide cases will post warning signs*
- ☐ Smell of rotten egg or sulfur
  - The smell of rotten egg usually indicates the presence of hydrogen sulfide
  - Note: Some callers will notice the smell immediately, where others may not*
- ☐ Smell of bitter or burnt almonds
  - The smell of bitter almond usually indicates the presence of hydrogen cyanide
  - Note: Some callers will notice the smell immediately, where others may be immune*
- ☐ Unresponsive subject inside the vehicle
  - Someone committing suicide with the proper chemical mixture will be dead instantly
  - May have seatbelt fasten to prevent body from falling onto horn, alerting others
  - In several documented cases, subjects wore goggles and gloves, to prevent chemical burn before their death
- ☐ Suicide note inside vehicle
- ☐ Pennies in the vehicle or console area will be tarnished with residue



Photo Sources: St. Lucie County (FL)

Continued

## INDICATORS OF A CHEMICAL SUICIDE<sup>10</sup>

### Unresponsive Person in a Vehicle cont...

- ☐ Empty household cleaning containers on the floor board or seat

*Note: Bonide pesticide containers commonly have purple caps and are found in many chemical suicide cases*



- ☐ One or more large buckets will be visible for mixing the acid base and sulfur chemical

*Note: Subjects may use the center console or glove box to mix the chemicals*

- ☐ Vehicle's inside door handles removed
  - This prevents the subject from changing their mind by stopping the suicide process

- ☐ Yellow-green or white residue on the seats or on the dashboard
  - Evidence of chemical residue has been found in almost all chemical suicide cases

- ☐ Duct tape to cover air vents
  - This prevents the deadly chemical mixture from seeping out, keeping the vehicle closed

- ☐ Tools to mix the chemicals will be present

- ☐ Windows fogged or tinted with yellow/green residue

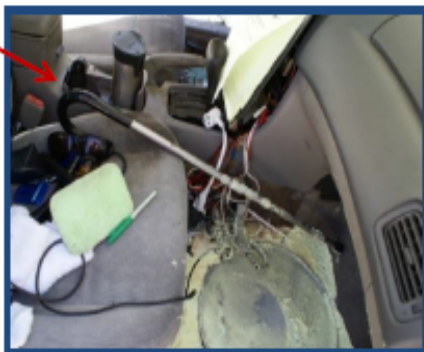
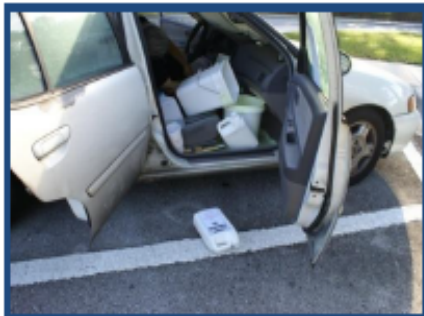


Photo Sources: St. Lucie County (FL)





## INDICATORS OF A CHEMICAL SUICIDE<sup>10</sup>

### Check the Well Being

Law enforcement officers have also discovered cases of chemical suicides after being dispatched to a "check the well being" call. These incidents have occurred in small confined spaces such as closets and bathrooms inside hotel rooms, college dorms and apartments. If the caller is at the location, gather information on the below indicators to recognize the potential of a chemical suicide:

- ☐ Masking tape or towels sealing a door to prevent fumes from exiting the confined area
- ☐ Smell of rotten egg or sulfur coming from the room
  - The smell of rotten egg usually indicates the presence of hydrogen sulfide
  - Note: Some callers will notice the smell immediately, where others may not*
- ☐ Smell of bitter or burnt almonds coming from the room
  - The smell of bitter almond usually indicates the presence of hydrogen cyanide
  - Note: Some callers will notice the smell immediately, where others may be immune*
- ☐ Suicide note taped to the door or mirror
- ☐ Warning sign(s) taped to the mirror or door
  - May indicate HAZMAT or SUICIDE
  - Note: Not all chemical suicide cases will post warning signs*
- ☐ Empty household cleaning containers that contain acid and sulfur
  - Note: Bonide pesticide containers commonly have purple caps and are found in many chemical suicide cases*
- ☐ One or more large buckets will be present to mix the chemicals



Photo Sources: NYS Division of Homeland Security and Emergency Services

Continued



**(U//FOUO) Safety Precautions**

- ❑ **DO NOT BECOME COMPLACENT:** Always be aware of ALL on scene clues available to you. Size up the situation before you act.
- ❑ **IF THERE IS A SMELL OF SULFUR OR ROTTEN EGGS:** This may indicate the presence of H<sub>2</sub>S gas, which is very dangerous even at low levels, impairing your sense of smell. Back off and don PPE with respiratory protection before acting. Request fire/hazmat with monitoring capability.
- ❑ **UNRESPONSIVE PATIENT IN A VEHICLE:** Warning notes or taped door and window seams, glass stains, or residue on the ground are a sure sign that you should exercise caution and escalate the response. Call for a hazmat team and police.
- ❑ **EVIDENCE OF CHEMICALS IN THE VEHICLE:** Typical chemicals, tubs, and other equipment mentioned in this bulletin are clues that an active reaction has filled the vehicle with toxic products. **DO NOT ENTER THE VEHICLE FOR PATIENT ASSESSMENT, WITHOUT DONNING FULL PPE!**
- ❑ **CREATE HAZARD ZONES:** Inside the vehicle is a hot zone. Create an appropriate warm zone around the vehicle. Prohibit entry from anyone not wearing full PPE.
- ❑ **NOTIFY APPROPRIATE ASSISTANCE:** Call the nearest hazardous materials response team, police, and other appropriate agencies. **TREAT THIS AS A HAZMAT SCENE!**
- ❑ **ENTRY INTO THE VEHICLE:** If the decision is made to enter the vehicle, use full PPE and completely vent the vehicle first. Position the patient **OUTSIDE** the vehicle for assessment. Remember, the atmosphere inside the vehicle is both an inhalation hazard and possibly an explosive hazard.
- ❑ **IF POLICE NEED TO PERFORM A TACTICAL ENTRY EITHER INTO A VEHICLE OR A SMALL ROOM:** Full SCBA is mandatory and the use of flash-bang or sting ball devices could cause an explosion because of the presence of flammable gases.
- ❑ **REMEMBER THAT THIS IS A POSSIBLE CRIME SCENE:** Make immediate notifications to police, the medical examiner, etc, and avoid disturbing any evidence.
- ❑ **BE ALERT FOR SECONDARY DEVICES:** Scan the vehicle or room for the presence of anything that looks out of place or suspicious. **DO NOT DISTURB OR TOUCH ANYTHING UNNECESSARY!**
- ❑ **FIRST AID ACTIONS:** Remove victim(s) from exposure, and if appropriate, support breathing. Skin contact with corrosive product may cause burns.
- ❑ **DECONTAMINATION:** Remove clothing ASAP. For eye or skin exposure, flush with lukewarm water for 15 minutes.
- ❑ **HAZMAT WASTE:** After the completion of victim/patient care and legal scene issues, the scene must be treated as a hazmat site. Waste products must be over packed and handled as hazardous waste by a licensed contractor. Notify the appropriate environmental agencies as needed.

**(U//FOUO) Sources**

1. [http://www.presspubs.com/white\\_bear/article\\_2b3ba3ea-4d79-11e8-acf5-a35a4b74f0c5.html](http://www.presspubs.com/white_bear/article_2b3ba3ea-4d79-11e8-acf5-a35a4b74f0c5.html)
2. <http://www.hazmatnation.com/rochester-hazmat-unit-responds-suicide-attempt/#sthash.us4b9nap.dpbs>
3. <http://www.swcbulletin.com/news/4014294-teen-police-injured-chemical-incident-cottage-grove-home>
4. [https://www.hometownsource.com/sun\\_post/news/government/apparent-suicide-near-robbinsdale-city-hall-prompts-brief-closure/article\\_b7ca2767-1d04-54be-ad2c-f308032091a3.html](https://www.hometownsource.com/sun_post/news/government/apparent-suicide-near-robbinsdale-city-hall-prompts-brief-closure/article_b7ca2767-1d04-54be-ad2c-f308032091a3.html)
5. <http://www.mlstargazette.com/story/2013/01/17/news/suicide-prompts-rest-stop-closure/353.html>
6. <https://www.firehouse.com/rescue/news/10708926/minnesota-chemical-suicide-prompts-need-for-training>
7. (U//FOUO) San Diego Law Enforcement Coordination Center. Chemical Suicide Continues to Pose a Threat to the Public and First Responders Situational Awareness Bulletin #14-004. 30 June 2014
8. (U) Central Florida Intelligence Exchange. Hydrogen Sulfide Suicide Trend-First Responder Safety Update. 14 October 2014
9. <http://www.fireengineering.com/content/dam/fe/online-articles/documents/2014/CBRNE-Detergent-Suicide-2014.pdf>
10. (U//FOUO) Central Florida Intelligence Exchange. Chemical Suicides: Identification Guide for 911 Communications. February 2011
11. (U//FOUO) Virginia Fusion Center-Virginia Department of Health First Responder Bulletin. Chemical Suicides: Awareness & Mitigation Factors to Consider. 7 February 2012

**(U) Resources**

[https://www.cdc.gov/niosh/ershdb/EmergencyResponseCard\\_29750036.html](https://www.cdc.gov/niosh/ershdb/EmergencyResponseCard_29750036.html) (Sodium Cyanide)  
[https://www.cdc.gov/niosh/ershdb/emergencyresponsecard\\_29750038.html](https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750038.html) (Hydrogen Cyanide)  
[https://www.cdc.gov/niosh/ershdb/emergencyresponsecard\\_29750027.html](https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750027.html) (Sodium Azide)  
[https://www.cdc.gov/niosh/ershdb/emergencyresponsecard\\_29750035.html](https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750035.html) (Phosphine)  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2564148/pdf/e03.pdf> (Aluminum Phosphide)  
<https://www.atsdr.cdc.gov/mmg/mmg.asp?id=1073&tid=19> (Hydrogen Cyanide management guidelines)  
<https://www.cdc.gov/co/faqs.htm> (Carbon Monoxide)  
<https://www.firerescue1.com/fire-products/hazmat-equipment/articles/968922-The-chemical-suicide-phenomenon/>  
<https://www.iafc.org/topics-and-tools/hazmat/fusion-center>  
<http://www.hazmatnation.com/chemical-suicide-response/#sthash.cYlusGH8.dpbs>  
<http://www.fireengineering.com/articles/2011/05/chemical-suicides.html>  
<http://www.dhSES.ny.gov/ofpc/publications/documents/chemsuicides.pdf>  
<https://www.firerescue1.com/fire-products/hazmat-equipment/articles/968922-Firefighter-threat-the-chemical-suicide-responses/>  
<https://www.mass.gov/files/documents/2016/09/na/chemical-assisted-suicide-responder-info.pdf>

The information contained in this communication from HSEM may be sensitive, privileged, and or confidential and is not intended for third party distribution without the express approval of HSEM. Please address requests for further distribution, questions, or comments to HSEM by phone (651.201.7457) or email ([nicholas.radke@state.mn.us](mailto:nicholas.radke@state.mn.us)). If you are not an intended recipient of this transmission, the dissemination, distribution, copying or use of the information is strictly prohibited