

Anhydrous Ammonia



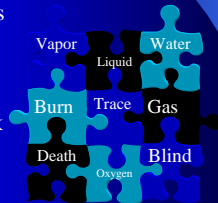
Safety Training

Introduction

- Anhydrous Ammonia (NH₃)
- Uses
(Both legal and illegal)
- Dangers involved with and treatment of exposure to Anhydrous Ammonia
- Protecting yourself and others
- What not to do

Overview

- Common chemical found in areas of agriculture
- When used properly NH₃ is beneficial
- When used illegally is extremely hazardous
- Relatively easy access for illegal use
- When handled improperly is a life risk to everyone exposed



Technical Information

- Product Name: Anhydrous Ammonia, Agricultural Grade, 82-0-0
- Chemical Name: Ammonia
- Chemical Family: Alkali
- Chemical Formula: NH₃
- Placard Number: 1005



Anhydrous Ammonia Uses

- Agricultural industry: Fertilizer
- Industrial applications: Manufacture of chemicals, synthetic fibers, cleaning solutions, and specialty fertilizers
- Illegal application: Manufacture of Methamphetamines

Anhydrous Ammonia

- Anhydrous Ammonia is a desiccant – it draws or evaporates moisture
- 85% of use is farm related
- 15% is industrial
- Anhydrous Ammonia stinks
- Anhydrous Ammonia alone is lighter than air (0.6 with air being 1) but settles to the ground due to evaporation of moisture.

Anhydrous Ammonia

- The boiling point of Anhydrous Ammonia is -28 degrees. This is the point it becomes vapor.
- The freezing point is -107 degrees
- Between -28 degrees and -107 degrees the product is liquid
- Normal Ph is 7.6
- Ph when moisture is added increases to 13.0 to 15.0
- When water is added to Anhydrous Ammonia it produces heat

Anhydrous Ammonia

- Anhydrous Ammonia presents in 4 forms:
Liquid: When the product exits the container in normal conditions. Temperature at release is approximately -55 degrees.
Dangers are frostbite and freezing.
Aerosol: When the product temperature is above -28 degrees
Dangers are freezing and frostbite.

Anhydrous Ammonia

Dense Gas: When the product has absorbed moisture.

Product is heavier than air. Makes a visible cloud. Cloud will try to rise but will fall back in on itself. There is no oxygen in a cloud. Rapid suffocation.

Trace: Vapor that is remaining after the evaporation of majority of the moisture

Legal Usage

When Anhydrous Ammonia is used in the agricultural or industrial setting and the proper safety rules are followed there is minimal risk of injury from this chemical.



BUT

Accidents, spills, and leaks happen!



Photo by Robert Henry of the News
No one was injured when this semi-trailer truck carrying anhydrous ammonia rolled over Monday near the U.S. Highway 2 and 52 bypass. The anhydrous ammonia did not leak and caused no immediate danger. The driver received minor injuries. For more on the story, see Page B4.





Illegal Usage

There is one major illegal use of Anhydrous Ammonia:

Clandestine Methamphetamine Labs!

Clandestine Meth Labs

- A clandestine lab is any lab that produces controlled substances without the proper license or certification of the governing authority
- Clandestine labs can be found anywhere: homes, businesses, farms, cars, barns, RV's, etc...
- There are no limits to the places that a lab can be set up.

Clandestine Meth Labs

- There are two classifications of clandestine meth labs: Stationary or mobile.
- There are other things produced in clandestine labs:
 - MDMA (Ecstasy)
 - GHB (Gamma – Hydroxybutyrate) (date rape drug)
 - CAT (Methcathinone)

Clandestine Meth Labs

- This does not include the dangers of the people running the lab and the weapons that they control!
- Most containers at a lab will not be labeled or the original.
- Anhydrous Ammonia can be stored in Styrofoam coolers, glass jars, thermos, propane tanks, Freon tanks, ... anything!

Effects of Methamphetamines

- Common names: Speed, Meth, Chalk
- Injected form names: Ice, Crystal, Crank
- Can be smoked, snorted, injected, or orally ingested
- The user is "hooked" after 2 – 3 uses.
- The high last 4 – 16 hours
- User binges using more drugs to keep the high longer. This also increases tolerance.

Effects of Methamphetamines

- At the end of the binge episode the patient begins "Tweaking"
- Tweaking is:
Depression and emptiness feeling. This leads to other depressants like ETOH and Heroin to ease the bad feelings. This is the most dangerous time to confront a user.
- Crash occurs after tweaking.

Effects of Methamphetamines

- Crash: Incredible amount of sleep because the bodies neurotransmitters are depleted. This can last 1 – 3 days
- Withdrawal or more use: Depression, loss of ability to experience pleasure, craves more drugs, and lack energy. Intense withdrawal can last 30 – 90 days. Memory loss, motor skill loss, and suicidal ideations can last up to 14 months



Effects of Methamphetamines

- Drug impact on society is an estimated 67 billion dollars per year.
- Using Birch (Nazi) method meth the user has a career use life span of approximately 10 years from first use. There is no stopping from using Anhydrous Ammonia produced amphetamines.
- Long term survival is non existent



Other Methamphetamines facts

- .25 grams = 1 hit
- 1 gram is enough for 4 users
- 1 gram sells for \$80 - \$120 dollars AND
- Busted with:
 - < 1 gram = 180 days – 2 years State jail
 - 1 – 4 grams with/without intent to sell or manufacture = 2 – 10 years TDCJ
 - 4 – 200 grams with/without intent to sell or manufacture = 5 – 99 years TDCJ
 - 200 – 400 grams = 10 – 99 years to life TDCJ
 - 400+ Grams = 15 – 99 years to life TDCJ

Other Methamphetamines facts

- Transporting or possession of Anhydrous Ammonia in a non certified or unapproved container or without proper paperwork or authorization = 2 – 20 years
- Possession of three or more chemicals in your possession that are used in the manufacture methamphetamines is enough to arrest you for probable cause to manufacture and sell.

Dangers of Anhydrous Ammonia

- Anhydrous Ammonia is a desiccant, It draws moisture to itself
- Adding water to Anhydrous Ammonia produces heat
- Levels above 300 ppm are an immediate danger to life and health
- It takes approximately 100,000 gallons of water to neutralize 1 gallon of Anhydrous Ammonia

Dangers of Anhydrous Ammonia

- Anhydrous Ammonia is very corrosive to brass (valves, nozzles) Look for corrosion of the valves on propane cylinders.
- Fresh release of Anhydrous Ammonia is -44 to -100 degrees
- There is no oxygen in a dense cloud of Anhydrous Ammonia
- Extreme thermal burns from direct exposure



Propane Tanks



Safety equipment to prevent exposure to Anhydrous Ammonia

- A direct liquid leak of Anhydrous Ammonia is a no entry zone, even in a level A haz-mat suit
- A dense cloud of Anhydrous Ammonia is a no oxygen environment
- No approach should be made to a dense cloud or vapor without an enclosed haz-mat suit and SCBA.
- For exposure less than 300 ppm a full face respirator with approved Ammonia concentration cartridge

Safety equipment to prevent exposure to Anhydrous Ammonia

- Never enter an exposure area without PPE.
- Exposure to an environment of greater than 300 ppm has a life expectancy of 1 minute or less.
- Any person who is down in direct release of Anhydrous Ammonia with vapor or liquid present will have died within a minute of exposure.

TREATMENT

- Rule #1:
 - 15 minutes for life!

Whatever you do in Ammonia first aid, it must be done fast! The longer it takes to administer first aid the greater the injury!

TREATMENT

- Liquid exposure:
 - Liquid to body:
 - Irrigate with a copious amount of water for a minimum of 15 minutes
 - Move the patient to fresh air as long as there are no dangers to you.
 - Call 911 if there is no immediate improvement in patient's condition.

TREATMENT

Follow up after 15 minutes. Look for blisters. If the patient is not completely free of complaints, transport immediately. Use no petroleum based products or salves, this traps ammonia vapor. If the patient continues to have complaints continue to irrigate and keep the patient's skin moist.

TREATMENT

- Liquid to eyes:
Irrigate with copious amounts of water for a minimum of 30 minutes.
Activate 911 immediately.
There is great chance of blindness from this exposure.

TREATMENT

- Removes moisture from the eyes and tear ducts. Damage to the eyes is permanent.
Cornea transplant is only 40% successful.
Use no salves or petroleum based products.
All exposures to eyes must be transported to the hospital. Need early notification to hospital so specialist can be contacted.
Continue to irrigate during transport.

TREATMENT

- Vapor to body:
Move the patient to fresh air as long as there is no danger to you.
Place the patient on high flow oxygen as soon as possible.
Activate 911 immediately
Check the patient for possible thermal injuries.

TREATMENT

- Follow up after 15 minutes.
Is the patient breathing freely? If not, transport immediately!
Be alert for airway swelling. If the airway is swollen, the patient will hiccough with deep respirations.
You can have airway swelling as late as 4 – 6 hours after the exposure.

TREATMENT

- Vapor to eyes:
Irrigate with copious amounts of water.
Move the patient to fresh air.
Activate 911.
Use no salves or petroleum based products.

CONCLUSION

- When used in the proper manner, Anhydrous Ammonia is relatively safe.
- Watch for anything suspicious and be prepared to notify authorities.
- Do not allow yourself to become a victim, remain aware of your surroundings and things that seem “out of place”.