Anhydrous Ammonia Handout

Ammonia, many times referred to as anhydrous ammonia, is a colorless gas with a bitter taste and a sharp, intensely irritating, characteristic odor. Its odor is readily detectable at 17 ppm. It is one of the highest volume chemicals produced in the United States. Ammonia is an efficient and widely used source of nitrogen fertilizer with several advantages, including its relatively easy application and ready availability.

Ammonia is a chemical made up of one part nitrogen and three parts hydrogen, hence it's chemical formula, NH_3. The properties of this chemical make it one of the most potentially dangerous chemicals used in agriculture. Ammonia gas is colorless and has a sharp, penetrating odor. Because of its boiling point (-28°F), it is easily liquefiable. Since so much more material can occupy the same space in a liquid form rather than as a gas, ammonia is usually shipped as a liquid. Since ammonia is easily liquefiable, it has found use as a refrigerant. Ammonia is colorless, resembling water as a liquid.

Since ammonia boils at minus 28 degrees F. it must be kept under pressure to be stored as a liquid above this temperature unless the storage temperature is maintained at this temperature. Ammonia in unrefrigerated storage tanks expands and increases the vapor pressure in the tank as the outside temperature increases. For example, at 60 degrees F., the pressure is 93 psi and at 100 degrees F, the pressure is nearly 200 psi. If a hose ruptures or a valve is unintentionally opened, the high pressure from a tank can cause ammonia to spray out possibly into your eyes, face, and other parts of your body before you can react.

When pressure is released, liquid ammonia quickly converts to a gas.

The acute effects of ammonia are listed below:

5 ppm	Least perceptible odor
20-50 ppm	Readily detectable odor
50 ppm	OSHA PEL-8hr work shift
50-100 ppm	No discomfort or impairment of health for prolonged exposure
150-200 ppm	General discomfort and eye tearing; no lasting effect on short exposure
400-700 ppm	Severe irritation of eyes, ears, nose, and throat; no lasting effect on short exposure
1700 ppm	Coughing, bronchial spasms
2000 -3000 ppm	Dangerous, less than one-half hour exposure may be fatal
5000-10,000 ppm	Rapidly fatal

Acute and Chronic Health Effects

The word "anhydrous" means without water. When anhydrous ammonia comes in contact with any moisture, the water and ammonia quickly combine. If ammonia contacts your eyes, skin or mucous membranes, it will cause rapid dehydration and severe burns as it combines with the moisture of the body.

Anhydrous ammonia is caustic and causes severe chemical burns. Body tissues that contain a high percentage of water, such as the eyes, skin, and respiratory tract are very easily burned. Victims exposed to even small amounts of ammonia require immediate treatment with large quantities of water to minimize the damage.

Warning Properties/ Personal Protective Equipment/Respirators

First Aid for Inhalation:

Remove the victim from the contaminated area while protecting yourself. Initiate artificial respiration and supply oxygen if needed. Keep victim warm and at rest. Seek medical attention, pulmonary injury may continue to evolve over 18 to 24 hours. If patient is conscious, the irritation of the throat may be relieved by water in the mouth. Seek medical attention immediately.

First Aid for Eye Contact:

Remove victim from the source of contamination and take to nearest eye wash or shower. Immediately wipe away any excess chemical very gently and quickly. Wash the affected eye or eyes under slowly running water for 15 minutes or longer, making sure the eyelids are held wide apart and moved slowly in all directions.

First Aid for Skin Contact:

Remove victim from source of contamination and take immediately to nearest shower or source of clean water. Wash victim down taking care to protect eyes. Wash until the feeling of stickiness or soapiness disappears. This may take an hour or more.

First Aid for Ingestion or Swallowing:

Loosen tight clothing around the neck and waist. Flush mouth several times with cold water and spit out. Give victim 1 to 2 cups of milk. Do not induce vomiting. Do not give oils or attempt to neutralize with an acid. Do not give sodium bicarbonate or carbonated drinks. If vomiting occurs, keep the head lower than the hips to prevent vomitus from entering the lungs.