

Iowa Department of Public Health
Hazardous Substances Emergency Events
Surveillance System

Top Ten Chemicals Released in Iowa
2000-2005

Thomas J. Vilsack

Governor

Sally J. Pederson

Lt. Governor

Mary Mincer Hansen, R.N., Ph.D.

Director

Iowa Department of Public Health

Overview

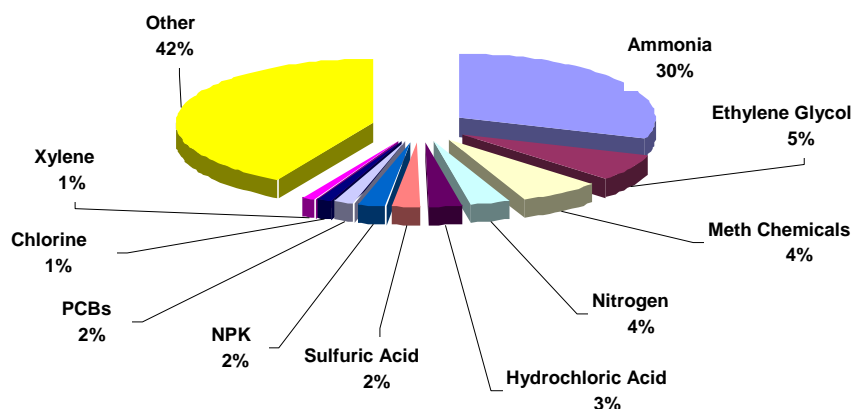
Since 1990, the Agency for Toxic Substances and Disease Registry (ATSDR) has maintained an active, state-based Hazardous Substances Emergency Events Surveillance (HSEES) system. The purpose of the HSEES system is to describe the public health consequences of releases of hazardous substances. Currently, 15 states participate in the HSEES program.

HSEES defines hazardous substances emergency events as uncontrolled or illegal releases or threatened releases of hazardous substances. Events involving releases of only petroleum are not included. Events are included if (1) the amount of substance released or might have been released needed or would have needed to be removed, cleaned up, or neutralized according to federal, state, or local law; or (2) release of a substance was threatened, but the threat led to an action (for example, evacuation) that could have affected the health of employees, emergency responders, or members of the general public. Notification sources include the Iowa Department of Natural Resources, National Response Center, Hazardous Material Information System, Iowa Department of Public Safety-Division of Narcotics Enforcement, and the Iowa Department of Public Health's Sentinel Project Researching Agricultural Injury Notification System.

In Iowa during 2000-2005, there were 1,924 emergency chemical releases that met the HSEES case definition. During these events, a total of 2,202 chemicals were released. This report contains information about the ten most commonly released chemicals in Iowa from 2000 through 2005. This data can assist planners and responders in developing hazard vulnerability assessments and assessing the preparedness of

responding agencies by identifying common acute chemical releases and associated injuries and evacuations. The “Other” category includes a wide variety of bases, pesticides, volatile organic compounds, paints and dyes, other inorganics, and mixtures of chemicals.

Chemicals Most Frequently Involved in Reported Events (n=1,924), 2000-2005



AMMONIA

From 2000-2005 there were 586 reported releases of ammonia in Iowa. Of all ammonia releases, 488 occurred at a fixed facility and 98 occurred when ammonia was being transported. These releases resulted in injuries for 34 employees, 19 members of the general public, three police officers and three firefighters. Fifty-three evacuations were necessary during these ammonia releases.

Description

Ammonia is a colorless gas with a strong odor. It is often used in water solutions. It is used in making fertilizer, plastics, dyes, textiles, detergents and pesticides.

Health Hazard

Exposure to ammonia can cause headache, loss of sense of smell, nausea and vomiting. Ammonia can affect you when breathed in. It is a corrosive chemical and can irritate and burn the skin and eyes. Exposure to ammonia can irritate the nose, mouth, and throat

causing coughing and wheezing. Breathing ammonia can irritate the lungs causing coughing and/or shortness of breath. Lung damage and death may occur after exposure to very high concentrations of ammonia.

METHAMPHETAMINE CHEMICALS

From 2000-2005 there were 122 reported releases of methamphetamine chemicals in Iowa. Of all methamphetamine chemical releases, 116 occurred at a fixed facility and six occurred during transportation. There were 85 evacuations reported. These releases caused injuries to 53 members of the general public (includes cooks), seven police officers and one firefighter.

Description

Common chemicals used in the manufacture of methamphetamine (meth) may include anhydrous ammonia, toluene, alcohol, paint thinner, lithium, iodine, sodium hydroxide, sulfuric acid and red phosphorus. Many of these products are common household items but may be flammable, water reactive, irritating, or corrosive.

Health Hazard

Because of the chemicals present during the meth cooking process, there is a high risk for exposure that can be harmful. Short-term exposure to high concentrations of chemicals can cause health problems such as respiratory problems, skin and eye irritation, headaches, nausea, and dizziness. For this reason, meth “cookers”, their families, and first responders are at highest risk of severe health effects including lung damage and chemical burns.

After a bust and seizure of a meth lab, there is often only a low exposure risk to chemical residues, but this contamination needs to be cleaned up. There is little known about the health effects from long term exposure to contaminants left behind after a meth lab is dismantled.

ETHYLENE GLYCOL

From 2000-2005 there were 80 reported releases of ethylene glycol in Iowa. Of all ethylene glycol releases, 35 occurred at a fixed facility and 45 occurred when ethylene glycol was being transported. No evacuations were necessary during these releases. Five members of the general public and four employees reported injuries during a release of ethylene glycol; however, the injuries were related to trauma rather than the chemical itself.

Description

Ethylene glycol is a clear, colorless, slightly syrupy liquid. It may exist in the air in vapor form. Ethylene glycol is odorless but has a sweet taste. It is used as antifreeze in heating and cooling systems, to de-ice planes, and as an industrial solvent. Ethylene glycol is also an ingredient in photograph developing solutions, hydraulic brake fluids, and inks used in stamp pads, ballpoint pens, and print shops.

Health Hazard

Exposure to ethylene glycol can irritate the eyes, nose, and throat. Exposure can cause a “drunk” feeling, nausea, vomiting, and headache. Eating or drinking very large amounts of ethylene glycol can result in death.

NITROGEN

From 2000-2005 there were 78 reported releases of nitrogen in Iowa. These releases resulted in no evacuations but three employees were injured. Of all nitrogen releases, 41 occurred at a fixed facility and 37 occurred during transportation.

Description

Nitrogen is a colorless gas or liquid under pressure. It is the main component of air. It has many medical and industrial uses including the quick freezing of food. Nitrogen is also used as a fertilizer.

Health Hazard

Contact with liquefied nitrogen can cause frostbit. Exposure to very high levels of pure nitrogen can cause you to feel dizzy and lightheaded. It replaces oxygen in the air causing loss of consciousness and death.

HYDROCHLORIC ACID

From 2000-2005 there were 54 reported releases of hydrochloric acid in Iowa. Of all hydrochloric acid releases, 42 occurred at a fixed facility and twelve were transportation related. There were nine evacuations associated with hydrochloric acid releases. Three members of the general public, two employees, and a police officer were injured during these releases.

Description

Hydrochloric acid is a colorless liquid with a pungent odor. It is used in the production of fertilizers, dyes, and refining edible oils and fats. It is also used in metal processing, leather tanning and in the photographic, textile and rubber industries. This acid is used as an antiseptic in household toilet bowl cleaners.

Health Hazard

Hydrochloric acid can cause severe irritation and burns to the eyes and skin. Exposure can irritate the mouth, nose, and throat. This acid can cause severe respiratory irritation with coughing, burns, breathing difficulty and possible coma.

SULFURIC ACID

From 2000-2005 there were 46 reported releases of sulfuric acid in Iowa. Of all sulfuric acid releases, 30 occurred at a fixed facility and 16 were transportation related. These releases resulted in one evacuation and nine employees were injured.

Description

Sulfuric acid is a clear, colorless, oily liquid. It is used in fertilizers, explosives, other acids and glue, dyes, petroleum refining, etching and lead-acid batteries.

Health Hazard

Contact with sulfuric acid can severely irritate and burn the skin and eyes. Breathing it can irritate the nose and throat. Repeated exposure can cause permanent lung damage, damage to teeth and stomach upset.

NITROGEN/PHOSPHORUS/POTASSIUM FERTILIZER (NPK)

From 2000-2005 there were 41 reported releases of NPK in Iowa. These releases resulted in no evacuations but one employee was injured. Of all NPK releases, 16 occurred at a fixed facility and 25 occurred during transportation.

Description

N-P-K is the chemical symbols for nitrogen, phosphorus, and potassium. These three elements are required by all forms of plant life. NPK is a plant nutrient.

Health Hazard

NPK may irritate eyes and skin upon prolonged or repeated contact. Over-exposure by inhalation may cause respiratory tract irritation. Ingestion of this substance may produce irritation of the gastro-intestinal tract.

POLYCHLORINATED BIPHENYLS (PCB)

From 2000-2005 there were 34 reported releases of PCBs in Iowa. PCB releases were included if the oil contained 50 or more parts per million of PCBs. Of all PCB releases, 33 occurred at a fixed facility and one occurred during transportation. There were no reported evacuations or injuries.

Description

Polychlorinated Biphenyls (PCBs) are mixtures of chemicals that form either a yellow, oily liquid or a solid that is colorless to light yellow. PCBs have no smell or taste. Some PCBs can exist as a vapor in the air. PCBs were used in insulating fluids of electrical systems. The manufacture of PCBs was stopped in the United States in 1977 because of harmful health effects. Products that were made before 1977 that may contain PCBs include old fluorescent lighting fixtures, transformers, microscopes and hydraulic oils.

Health Hazard

PCBs can affect you when breathed in and by passing through the skin. They can irritate and burn the eyes. Exposure to vapor can irritate the nose and throat. PCBs may cause an acne-like rash following skin contact, which can continue for several years. PCBs are known to cause cancer in animals.

CHLORINE

From 2000-2005 there were 22 reported releases of chlorine in Iowa. All chlorine releases occurred at a fixed facility. These releases resulted in seven evacuations. There were three employees and three members of the general public injured during chlorine releases.

Description

Chlorine is a greenish-yellow gas with a strong, irritating odor. It is used in making other chemicals, as a disinfectant, in bleaching, and for purifying water and sewage.

Health Hazard

Chlorine can affect you when breathed in. Exposure can irritate the nose and throat causing tearing, coughing, sputum, bloody nose, and chest pain. Contact can severely irritate and burn the eyes and skin causing permanent damage.

XYLENE

From 2000-2005 there were 23 reported releases of xylene in Iowa. Of all xylene releases, 22 occurred at a fixed facility and one occurred during transportation. Two

evacuations were reported for xylene releases. A single release of xylene resulted in eight members of the general public and eight hospital personnel being injured.

Description

Xylene is a colorless liquid with a strong sweet-smell. It is used as a solvent and in the printing, rubber and leather industries. It is also used in paints and varnishes. Xylene is found in small amounts in airplane fuel and gasoline.

Health Hazard

Exposure to xylene can irritate skin, eyes, nose and throat. It can cause headache, nausea, and vomiting. High levels can cause dizziness, confusion, passing out and even death.