Phosgene2	***Gases 44P***	***make Hydrogen***	***website***
Tear Gas,2	***KCN 2, make***	***somoom***	
Ricin	***CHLORINE,2***	**Chemical Agents**	***Chlorine pwdr*** ***Sugar water***

Phosgene

Phosgene, also known as carbonic dichloride, colorless, **extremely toxic gas of formula $COCl_2$** with an unpleasant, irritating odor at high concentrations. It is prepared by the reaction of carbon monoxide with chlorine in the presence of a catalyst. Phosgene is poisonous in concentrations above 50 parts per million of air, and if inhaled, it causes severe and often fatal edema of the lungs within a few hours. It was used in World War I as a poison gas but today is used principally as an intermediate in the synthesis of organic compounds, including carbonic esters, isocyanates, polyurethanes, and dyes.

Phosgene is 3.43 times heavier than air; the gas melts at -118° C (-180.4° F) and boils at 8.3° C (46.9° F).

Look here Chemical war section.

Tear Gas

I INTRODUCTION

Tear Gas, chemical substance that produces a primary physical effect of stinging or tearing eyes. Tear gas also irritates other mucous membranes and causes choking and coughing. People exposed to higher concentrations may experience burning, itching, or even blistering skin. As a form of riot control, police often use clouds of tear gas to break up crowds of people. A rifle-fired grenade or a thrown canister usually delivers tear gas, but smaller hand-held spray devices also exist. Tear gas may also be used to force the surrender of fugitives hiding in a building. Dogs and horses are relatively unaffected by tear gas, so they can add to the riot-control effect of the gas.

II TYPES OF TEAR GAS

CN and CS are the two main types of tear gas. CN's scientific name is chloroacetophenone, and it comes in several variants. CNB adds benzene and carbon tetrachloride, while CNC adds chloroform. CNS adds chloropicrin (PS), which can cause victims to vomit or suffer lung damage. CN was discovered in Germany in the 1860s. It was used early in World War I (1914-1918) with mixed results.

CS's scientific name is chlorobenzylidene malononitrile. It was first made in the 1920s. It is considered less toxic and more potent than CN and is used much more often. A person engulfed by CS begins tearing, coughing, and feeling dizzy or nauseous. Unlike CN, CS can be washed off easily.

History:

Tear gas was first used early in World War I, setting the stage for the use of stronger chemical warfare agents like chlorine in 1915. Compared to the effects of these chemical agents, the effects of tear gas are milder and shorter-lived, so that tear gas was deemed an ineffective weapon against prepared troops. However, tear gas was used during the Vietnam War (1959-1975) by United States troops to aid in combat operations.

After World War I, police and internal security forces became the largest users of tear gas, using it mainly as a riot-control agent. Some notable events that saw extensive use of tear gas include the Bonus March in Washington, D.C., in 1932, the Democratic Party's Chicago Convention of 1968, frequent Israeli-Palestinian clashes, and the siege of the Branch Davidian compound near Waco, Texas, in 1993.

Current police training suggests using CN in confined spaces and CS outdoors. Critics of tear-gas use say that because the concentrations cannot be controlled, dense pockets of gas may cause death or injury. Also, the projectiles carrying the gas can injure and even kill. Very little is known about long-term side effects, although research suggests that the risk is low. Some forms of tear gas are available for personal protection.

See also Chemical and Biological Warfare.

Ricin:

Ricin, toxin derived from the **beans of the castor bean plant** (*Ricinus communis*). As it can be produced easily and inexpensively, and is highly toxic, it is a potential biological weapon. It is on the Centers for Disease Control and Prevention's "B" list of agents—that is, it is considered a moderate threat. *See also* Chemical and Biological Warfare.

Ricin can be **disseminated as an aeroso**l and as a **food or water contaminant**. It is particularly effective when **administered by injection**. Breathing in ricin in an aerosol form causes serious lung damage and eventual respiratory failure. Swallowing the poison causes gastroenteritis, bloody diarrhea, and vomiting; once circulating in the blood, major organ systems fail and death occurs within 36 to 72 hours. Ricin has **no known antidote**.

Castor beans are used in the production of castor oil. The aqueous phase in the process of making castor oil yields a mixture consisting of 5 to 10 percent ricin. Separating the ricin from this mixture involves **chromatography, a technique** by which pure substances are separated from complex mixtures.

Ricin can be made into a powder. To be absorbed through the skin, ricin needs to be enhanced with a strong solvent such as dimethyl sulfoxide (DMSO). The most lethal means of administering the toxin is **directly into the bloodstream. One microgram (mcg) per kilogram (kg) of body weight can kill if injected.** As a spray, it would only be effective if used in a confined place. Its toxicity when compared to living, replicating biological agents limits ricin's use as a weapon of mass destruction. A large amount would be necessary to produce the desired effect of such a weapon. For example, about 4 metric tons of ricin would be needed to cover an area of 100 sq km (62 sq mi) and cause death among 50 percent of the people exposed, assuming an aerosol toxicity of 3 mcg/kg and optimum dispersal conditions. **Only 1 kg (2.2 lb) of anthrax (*Bacillus anthracis*)** would be required to achieve the same result.

Ricin has generally been regarded as more likely to be used in a targeted strike on an individual or small group of people rather than for a mass attack. The most famous example of its use was the assassination in London, England, in 1978 of a Bulgarian dissident, Georgi Markov. However, ricin would be effective as a disabling agent, and the very idea of anyone possessing even small amounts of it could create the terrorist's desired effect of panic. Also,

its potential use as a food and water contaminant could easily incapacitate many people and overwhelm local medical resources.

Iraq produced ricin in large quantities in the 1980s, but no stocks of the toxin were discovered following the U.S.-Iraq War of 2003. In January 2003 “traces” of ricin were discovered in a north London apartment, and five men were subsequently charged under the United Kingdom’s Chemical Weapons Act of 1996 (although ricin is classified medically as a biological weapon). This was the first terrorist case involving chemical or biological weapons in the United Kingdom. Although no terrorist group has yet used ricin, al-Qaeda is believed to have hidden supplies of the toxin.

There have been other isolated cases in recent years. For example, in 1991 in Minnesota, four members of the Patriots Council—a far-right extremist group that advocated the overthrow of the United States government—were arrested for plotting to kill a law enforcement officer with ricin that had been produced in a home laboratory. They planned to mix the ricin with DMSO and then smear it on the door handles of the officer's car. In February 2004 ricin powder was found on a letter-opening machine in the office of U.S. Senate majority leader Bill Frist. No illnesses were reported, and a federal investigation was begun.

Chemical Agents

Chemical warfare agents can be grouped into two general types: those that affect the body surfaces they contact, and those that damage the general nervous system. Surface agents include phosgene gas, chlorine gas, hydrogen cyanide, and mustard gas. The principal action of phosgene, chlorine, and hydrogen cyanide occurs through inhalation. Phosgene is a choking agent that causes the lungs to fill with water, while chlorine destroys the cells that line the respiratory tract. Hydrogen cyanide blocks oxygen from reaching the blood. Mustard gas is actually composed of tiny droplets of liquid that are dispersed in the air, where they are inhaled like a gas. Mustard is a blistering agent that damages any surface it contacts, including the skin, eyes, and lungs. It may cause death by respiratory failure. See also Tear Gas.

Nerve agents act by blocking the transmission of nerve messages throughout the body. These agents include sarin, soman, tabun, and VX. All act by disrupting the normal action of a neurotransmitter called acetylcholine. Whether inhaled or absorbed through the skin, a single drop of nerve agent can shut down the body’s nervous system. The most powerful of this group is VX, but all can cause death within minutes after exposure. See also Nerve Gas.

Herbicides, such as Agent Orange, are chemicals that kill vegetation. Agent Orange was used during the Vietnam War (1959-1975) as a defoliant, destroying jungle leaves to expose enemy troops. Some people regard herbicides as chemical weapons if used for hostile purposes, but there is no universal agreement about this, since herbicides are not directly intended to harm humans or animals. However, veterans of the Vietnam War suffered several health problems blamed on exposure to Agent Orange and other toxins, and the Vietnamese government charged that civilians were harmed by exposure to Agent Orange.

Chemical weapons can be divided into five main classes: incapacitating, choking, blistering, blood, and nerve agents. Incapacitating agents are the only deliberately nonlethal chemical weapon. They include the tear gases and pepper sprays typically used by police and other law enforcement agencies for crowd control or to subdue a person temporarily. Choking agents attack the victim’s respiratory system and hamper breathing, leading to death by suffocation. Blister agents produce large blisters on exposed skin that do not heal readily and therefore easily

become infected. Blood agents, which victims absorb through breathing, enter the bloodstream and lead to convulsions, respiratory failure, and death as they shut down the body's functioning. Nerve agents are especially effective. They can be either inhaled or absorbed through the skin and quickly attack the central nervous system, obstructing breathing.

Biological agents are disease-carrying organisms that infect people through inhalation, contaminated food or water, or contact with the skin. They include bacterial toxins, such as anthrax, Clostridium botulinum (botulism), and salmonella; plant toxins such as ricin; and viruses, such as tularemia, yellow fever, and smallpox.

The history of chemical warfare traces largely back to a single man: Fritz Haber, who developed poison gases for Germany during the First World War. **Poison gases of various sorts were already available as unwanted by-products of chemical processes**. At his Berlin institute, founded by the Kaiser himself, Haber began experimenting with and

Biological Warfare and its Cutaneous Manifestations

by Thomas W. McGovern and George W. Christopher

In 1978, Bulgarian dissident Georgi Markov was assassinated using an ?umbrella gun? that shot ricin into his thigh. At least 66 people died of inhalational anthrax when an aerosol of Bacillus anthracis spores was accidentally released from a BW research facility in Sverdlovsk, USSR in 1979. By 1991, the Iraqis had weaponized anthrax, botulinum toxin, and aflatoxin