Chemical Warfare Essay, Research Paper

Chemical Warfare

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In this report I will be giving a history of chemical warfare. I will also be showing a chart that includes the Agent, and many other useful information about nerve gas agents which are the main item for chemical warfare. This report will also include the effects of nerve gas on the human body.

Chemical Warfare is an extremely dangerous form of warfare. An inquisitive scientist accidentally stumbled upon the engineering of nerve gas agents in the ?30?s by the name of Gerhard Schrader. He was working on a solution to the troublesome insects in Germany when he stumbled onto a solution for a larger problem?humans.

With World War II less than a decade later the Germans now possessed an extremely efficient killer. The Soman, Tabun, and Sarin that Gerhard had engineered were some of the most toxic substances known to humankind. Fortunately, Adolf Hitler never used these devastating weapons during the war. The reason why he made this decision is still unknown to many people. The most popular explanation for Hitler’s decision goes back to the previous World War where toxic gases were used in combat. Hitler had been harmed by these chemical agents and was unwilling to introduce new and more toxic agents. There is also evidence that suggests that Hitler was advised against using the agents and even stopped their production. Hitler’s Minister of Production, Albert Speer, said after the war that sensible military leaders turned gas warfare down as being insane, since, America’s airforce was the best at the time and probably still is. It would not be long before it would wreak havoc on German cities if Hitler had even considered chemical warfare had be used.

After the war, British chemist R. Ghosh (his first name was never mentioned in my research) discovered another more indestructible agent known as VX. It had a more stable structure, which allowed it to live longer in the air and ground, killing more life. Since VX?s discovery in 1949 there has only been minor advancements in the nerve gas agents. Most of the more powerful countries began to stockpile their chemical weapons as if saying, ?We are more powerful than you.?

There have only been two real incidents where nerve gas agents have been used. One of the events was the Iran and Iraq war that lasted from 1984 to 1988. Iraq used the nerve agent Tabun against Iran. Another incident was when a Japanese Cult known as the Aum Shinrikyo Cult put a Sarin gas bomb in a heavily populated Tokyo subway. This posed an all new problem?Terrorists have the most deadly substance known to mankind.

The following chart contains the key for the Nerve agents, the route into the human body, the form in which it goes in, the effect and how much is needed to do that damage:

AGENT ROUTE FOR EFFECT TYPE DOSAGE

Sarin inhalation vapor incapacitation ICt50 35 mg-min/m3

inhalation vapor death LCt50 70 mg-min/m3 percutaneous liquid death LD50 1700 mg/70 kg man

ocular vapor meiosis ECt50 \*2 mg-min/m3

Soman ocular vapor meiosis ECt50 \*2 mg-min/m3

inhalation vapor incapacitation Ict50 35 mg-min/m3

inhalation vapor death LCt50 70 mg-min/m3

percutaneous liquid death LD50 350 mg/70 kg man

Tabun percutaneous liquid death LD50 9.3 mg/kg (MONKEY)

inhalation vapor death LCt50 187 mg-min/m3 (monkey)

inhalation vapor death LCt50 135 mg-min/m3 (MAN)

VX ocular vapor meiosis ECt50 \*.9 mg-min/m3

inhalation vapor incapacitation ICt50 25 mg-min/m3

inhalation vapor death LCt50 30 mg-min/m3

percutaneous liquid death LD50 10 mg/70 kg man

Nerve agents are generally colorless, odorless, and are readily absorbable through the lungs, eyes, skin, and intestinal tract without producing any irritation. They are also extremely potent, so even a brief exposure can be fatal. Death may occur in 1 to 10 minutes, or be delayed for 1 to 2 hours, depending on the concentration to which a victim has been exposed. The symptoms that you would develop and the order that they come in are near to extraordinary. First, your nose would begin to run, then your chest would feel constricted. Your vision would dim as your pupils contracted into pinpoints. You’d begin to drool and sweat excessively. Then would come nausea and vomiting, intestinal cramps and involuntary urination or defecation. You’d twitch, jerk, and stagger as you’re overcome with convulsions and possibly coma. Finally, you’re breathing would stop as your diaphragm and the muscles of your chest froze, causing you to die of suffocation. First of all, dying of suffocation would by itself be horrible but to suffocate after all that would be just unbearable. I would most definitely shoot myself if that ever became an option.

A nerve agent works in a strange way. It blocks the synapse from completing its cycle so it is repeated over and over again. I cant explain this in my own words so I will use the dictionary?s explanation:

A nerve cell sends an electrical impulse down the length of itself until it reaches the end where there is a physical gap, called a synapse, between itself and the next nerve cell or the tissue that it stimulates. At this point the transmitting nerve cell releases a chemical (neurotransmitter) into the synapse where it diffuses across to receptor sites located on the receiving cell which stimulate the desired reaction. Once this is accomplished an enzyme will break the neurotransmitter down to end the stimulation. The neurotransmitter that nerve agents act upon is acetylcholine. Acetylcholine (Ach) is involved in the stimulation of glands, skeletal muscle, and smooth muscle (gastrointestinal tract) and the enzyme that acts upon it is acetylcholinesterase (Achase). When a nerve agent enters the body, it binds preferentially to Achase so that it cannot degrade the Ach. This means the Ach is able to stimulate the nerve again and again. The receptor will continue to signal the muscle or gland to contract or secrete, which causes the cramping and drooling.

Very difficult to understand but an excellent description of how a nerve agent kills you.

No chemical warfare agent is useful without an antidote. The most common antidote for nerve gas is atropine. Atropine locks to the Ach receptors without causing stimulation. It then provides protection against the overwhelming amount of Ach. Basically, atropine treats the symptoms, but not the cause. So, atropine is commonly used in combination with another type of chemicals, called oximes. Oximes treat the cause of the problem by restoring the Achase to a working form by breaking the enzyme-nerve-agent bond.

As you can see nerve gas agents are one of the most dangerous works of chemical engineering ever crafted or should I say, accidentally stumbled upon in the history of the human race. It is inevitable that someday we will have to fight a chemical war. All I can say is, ?I hope I’m not on this earth when it happens!? It will be the nastiest and deadliest war in the World?s history. Terrorists have nerve gas and are always threatening to use it. If we break down the root word of Terrorist you get Terror and terror means frighten. I don?t think terrorist with any common sense at all will use never use it. Let them threaten if they chose but let us all hope that there will never come a day when a terrorist organization uses nerve gas to wreak havoc on the world.