The chemistry of chloroform flashcard

Having been relied on for years as an opium and alcohol for pain relief, the introduction of ethyl ether as an anesthetic In 1846 was a revelation for the medical profession. However, ether produced undesirable after effects such as nausea and vomiting. Chloroform began to be used by Brutish physicians as a more pleasant alternative In the late asses. It soon became exceptionally popular, due to the combination of two factors: a paper describing the exact procedure for its use, published in the Lancet medical journal in 1847 by Scottish doctor James Young

Simpson.

Soon after being published, Queen Victoria insisted on using chloroform while giving birth to Prince Leopold in 1853. As the use of chloroform increased, the news of unexplained deaths started appearing rapidly. It turned out that chloroform has a much lower therapeutic index than ether, which Is to say that the difference between the dose needed to produce the anesthetic effect and the dose needed to cause cardiac arrest is much smaller. The use of chloroform as an anesthetic saw a sudden decline, as chloroform does cardiac or respiratory arrest.

In 1 870, an analysis of 80, 000 operations performed with the aid of chloroform showed that the risk of a patient dying was 1 in 2500.

In comparison, using ether resulted in only 1 death for every 23, 000 operations. By 1875, the British Medical Journal noted that the number of operations performed under ether exceeded those performed under chloroform. Phosgene (COCOA) Chloroform, if stored for long periods of time, can be dangerous. Oxidation of chloroform by oxygen In the air can

generate phosgene, COCOA, which was used as a chemical weapon during World War I.

Phosgene, although a gas at room temperature readily dissolves In chloroform, where It remains until It Is chemically treated for removal.

Adding a stabilizer Like ethanol or pentane can prevent the oxidation If long term storage is required. Despite its toxic past, today chloroform finds many uses in industry. It is used as a feedstock to make trinitrotoluene – a key intermediate in the manufacture of the non-stick polymer Teflon. Chloroform is commonly used as a solvent because of it relatively doesn’t react with nature, high miscibility with most organic solvents and convenient instability.

Tetrachloride’s, CDC, in which the hydrogen atom is replaced by its heavier isotope deuterium, is the most commonly used solvent for nuclear magnetic resonance spectroscopy, because it easily dissolves a wide range of different molecules.

Dishonorable(CHIC) Also, of interest to synthetic chemists is its use as a source of dishonorable, CHIC. Using a base like hydroxide, the hydrogen atom and one of the chlorine atoms can be removed. This highly reactive molecule can then be used to bolt extra carbon atoms onto other molecules like alikeness to make 3-member cyclopean rings. Cyclopean