Trinitrotoluene (Tnt) Encyclopedia Article

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Trinitrotoluene (Tnt)

Trinitrotoluene (TNT), $CH_3C_6H_2(NO_2)_3$, is a crystalline, aromatic compound that can be explosive with the aid of a detonator, but is not as unstable as **nitroglycerin**. TNT is the product of toluene (C_7H_8), a colorless, liquid, aromatic **hydrocarbon**, after its been treated with a combination of nitric and sulfuric acids a process known as nitration.**Aromatic hydrocarbons** all contain benzene(C_6H_6) a **chemical compound** that is made up of six **carbon** atoms structurally arranged in a **ring**. Aromatic hydrocarbons can be isolated from **coal** tar.

TNT is a substance that traces its roots to the dye industry and later research by German chemist Adolf von Baeyer. It is the most powerful nonatomic military explosive of the twentieth century. Sources credit J. Wilbrand with its initial discovery in 1863. Although probably first employed in the Russo-Japanese War of 1904-05, TNT was not mass-produced or regularly used until its refinement by the Germans during World War I. Fired by long-range guns, TNT shells encased in steel exploded with a force of 2,250,000 pounds per square inch.

In both world wars, new forms of TNT were introduced. These included TNT in combination with such similarly volatile compounds as TNX, PETN, and RDX. One mixture, RDX-TNT, or cyclonite, with a detonation pressure of 4,000,000 pounds per square inch, is regarded as the most powerful of this new class of weaponry. It is especially forceful when combined with **aluminum** in the form of torpex. TNT itself is composed of **nitrogen**, **hydrogen**, carbon, and **oxygen**. Despite its violent potential when detonated, it is extremely safe to cast into shells and handle and is thus a preferred high explosive.