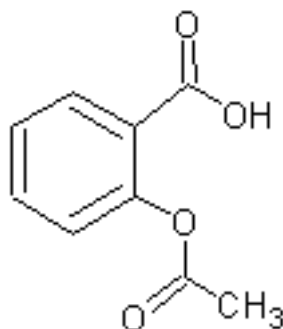
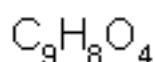


### Aspirin



Aspirin

Acetylsalicylic Acid



The common use of Aspirin is to relieve, inflammation, headache, toothache, fever and pain of all types. Because it is an analgesic, it is especially efficient at relieving pains associated with rheumatic fever, rheumatoid arthritis, osteoarthritis, and other musculo-skeletal conditions.

Aspirin and its effects have been known since the ancient Greeks recorded the use of the willow bark to fight fever. The bark and leaves of the willow tree contain salicin, a natural compound that is similar to acetylsalicylic acid, which is the chemical name for aspirin. In 400 BC it was used by a Greek physician (Hippocrates) who prescribed the bark and leaves of the willow tree. Then in 1832 while experimenting with salicin a German chemist creates salicylic acid (SA).

Aspirin was not invented, it was discovered through research. Aspirin's discovery was the product of the work of several of its inventors. In 1897, a German chemist in Friedrich Bayer and Company was searching for a treatment for his father's arthritis pain. This way he produced the first form of Aspirin. The compound was named aspirin because it stands for: "a" from acetyl, "spir" from the spirea plant (which yields salicin) and "in," a common suffix for medications. Then in 1899, The Bayer Company provided aspirin to physicians so they would be able to give to their patients, and due to its safety and usefulness it becomes the number one drug worldwide. Sixteen years later

in, 1915 Aspirin is manufactured in tablet form and becomes available without a prescription. Then by 1948 Dr. Lawrence Craven, notices that the men he prescribed aspirin to hadn't suffered any heart attacks. Due to its success in 1952 aspirin makes a chewable tablet for children. By 1988 the use of aspirin expanded it was not only a pain reliever but was considered a potential lifesaver. The FDA proposes use of aspirin for reducing the risk of heart attacks. The FDA also approved the use of aspirin for the prevention of "mini-strokes" in men and made aspirin standard therapy for men who have strokes. However this beneficial effect only works on men, why it does not work on women is unknown.

What Aspirin Does is that it reduces the body's production of a certain group of substances that are called prostaglandins. They are fatty acids that our body's cells produce and are released when the cells are damaged. The released prostaglandins promote inflammation in all the body and interact with other substances that also cause inflammation. Aspirin is used to relieve fever, because some prostaglandins produce fever by their reaction on brain centers. A certain type of prostaglandin (prostaglandin thromboxane  $A_2$ ) can cause blood platelets to clump together, however other prostaglandins like prostacyclin have the opposite effect. So by reducing the body's production of prostaglandins, aspirin makes a huge chemical pathway that is responsible for fever, blood clotting and inflammation, and therefore relieves pain.

Aspirin also has its disadvantages because of its toxicity. In high doses that are often necessary to relieve inflammation and pain, aspirin causes irritation to the stomach. This effect may be minimized or sometimes avoided by taking aspirin with food but its overuse can damage your stomach and small intestine. There have been some cases in which high doses of aspirin over a prolonged period damage both the liver and the kidneys. Extremely high doses can cause death by interfering with the thinking centers and respiratory in the brain.

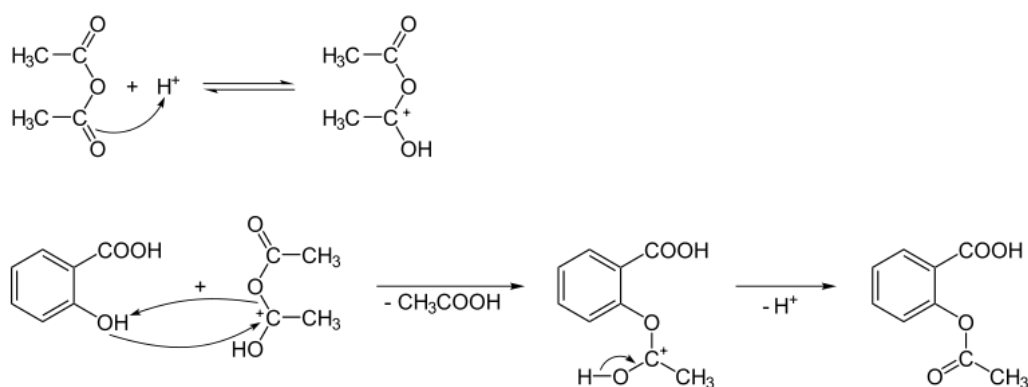
Salicycin (comes from the willow bark) is a glycoside formed from a molecule of salicylic acid and a sugar molecule. Salicylic acid is easily synthesized on a large scale by heating sodium

phenoxide with carbon dioxide at 150°C under some pressure. Aspirin, or acetylsalicylic acid, is a white, crystalline, poorly acidic substance. Its melting point is of 135 °C (275 °F). In solutions of ammonium acetate or of the acetate, carbonates, citrates or hydroxides of the alkali metals acetylsalicylic acid decomposes quickly. Its systematic name is 2-(acetyloxy) benzoic acid. The chemical formula of aspirin is C<sub>9</sub>H<sub>8</sub>O<sub>4</sub>.

The way to produce hard aspirin tablets is to add to the active ingredient (acetylsalicylic acid) cornstarch and water to serve as both a binding agent and lubricant and filler. These binding agents help to hold the tablets together; fillers give the tablets increased bulk to make the tablets the adequate size. During mixing a portion of the lubricant is added and the rest of the lubricant is added after the tablets are compressed. The lubricant is used to stop the mixture from sticking to the machinery. Some examples of lubricants that could be used are: hydrogenated vegetable oil, stearic acid, talc, or aluminum stearate.

Aspirin tablets of the same amount of dose are manufactured in batches. After weighing the materials the necessary ingredients are mixed and compressed into units of granular mixture called slugs. The slugs then are filtered to remove air and any other lumps, and are compressed again into many individual tablets. Finished tablets have several tests done before they are bottled and packaged for distribution for safety. This procedure for manufacturing hard aspirin tablets is known as dry-granulation or slugging.

#### Aspirins Reaction Mechanism



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