

Physical and Chemical Properties of Aspirin

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DESCRIPTION

Aspirin, commonly known as Acetylsalicylic Acid (ASA), is a pain reliever, fever reducer, and inflammation reducer. Kawasaki illness, pericarditis, and rheumatic fever are some of the inflammatory disorders that aspirin is used to treat.

Usually taken soon after a heart attack, aspirin lowers the chance of death. In high risk adults, aspirin is also used long-term to help prevent heart attacks, cerebrovascular strokes, and blood clots. The consequences of pain or fever usually start within 30 minutes. Aspirin is a Non-steroidal Anti-inflammatory Drugs (NSAIDs) that operates in the same way as other NSAIDs but also inhibits platelet activity. Aspirin, a common analgesic, antipyretic, and Non-steroidal Anti-inflammatory Drugs (NSAIDs), works by decreasing COX activity in platelets, preventing the synthesis of thromboxane A₂, which binds platelets together during coagulation and causes vasoconstriction and bronchoconstriction.

An irritable stomach is a typical negative effect. Stomach ulcers, stomach bleeding, and asthma exacerbation are among the more severe adverse effects. Those who are older, consume alcohol, use other NSAIDs, or take other blood thinners are at a higher risk of bleeding. In the last months of pregnancy, aspirin is not advised. Because of the possibility of Reye syndrome, it is not typically advised in children with infections. Ear ringing is a side effect of high dosages.

For at least 2,400 years, a forerunner to aspirin found in the leaves of the willow tree (genus *Salix*) has been utilized for its health benefits. For the first time, scientist Charles Frédéric Gerhardt combined sodium salicylate with acetyl chloride to generate acetylsalicylic acid in 1853. Other scientists established the chemical structure and found more efficient manufacturing methods during the next 50 years.

Aspirin is one of the most extensively used drugs in the world, with an estimated annual consumption of 40,000 tonnes (44,000 tonnes) (50 to 120 billion tablets). It is listed as an essential medicine by the World Health Organization. It's a drug that's accessible as a generic. With almost 18 million prescriptions written in 2019, it was the 38th most widely prescribed drug in the United States.

Physical properties

Aspirin is a white, crystalline, mildly acidic chemical with a melting point of 136 °C (277 °F) and a boiling temperature of 140 °C (284 °F). It is an acetyl derivative of salicylic acid. At 25 °C (77 °F), its acid dissociation constant is 3.5.

Chemical properties

In solutions of ammonium acetate or the acetates, carbonates, citrates, or hydroxides of the alkali metals, aspirin decomposes fast. It is stable in dry air, but when exposed to moisture, it degrades into acetic and salicylic acids. The hydrolysis of acetate and salicylate occurs fast in alkali solutions, and the clear solutions generated may contain just acetate and salicylate.

Because the powder-air combination can be explosive, aspirin tablet producers, like flour mills, must limit the quantity of powder that becomes airborne inside the structure. In the United States, the National Institute for Occupational Safety and Health (NIOSH) has set a recommended exposure limit of 5 mg/m³ (time-weighted average). The Occupational Safety and Health Administration (OSHA) established an aspirin legal allowable exposure limit in 1989.

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