Acetone
Product Stewardship Summary
(CAS number 67-64-1)

Chemical Formula for Acetone

CH3COCH3

What is Acetone?

Acetone, also sometimes known as 2-propanone or dimethyl ketone (DMK), is widely used as a chemical intermediate in the production of other chemicals. It is also a valuable solvent.

Acetone is manufactured by Shell Chemicals via two different routes. In the first, it is derived from the basic raw materials of benzene and propylene. These materials are first used to produce cumene, which is then oxidised to become cumene hydroperoxide, before being split into phenol and its co-product, acetone.

In the second route, acetone HP (high purity) is manufactured from isopropyl alcohol (IPA). Shell Chemicals manufactures acetone HP at two locations in Europe and sell it into the European market.

Shell Chemicals supplies Acetone in two different grades: industrial grade and National Formulary (NF) grade, the latter of which is produced applying Good Manufacturing Practices (GMP) throughout the production and supply chain. GMP ensures that products and their ingredients sold into food, drug and cosmetic applications possess the quality, purity and safety which they purport to possess and are suitable for their intended use.

How is Acetone used?

Acetone is used primarily in the production of commercial products such as acrylic plastics, which are used for glazing, signs, lighting fixtures and displays. Acetone is also used in the production of Bisphenol A (BPA) which is manufactured from acetone and phenol. BPA is, in turn, used to manufacture polycarbonate (the largest and fastest growing use for BPA), and epoxy resins. Both polycarbonate and epoxy resins are used in many different industries and in countless items which we encounter everyday. The use of acetone as an intermediate feedstock for acrylics and BPA accounts for two thirds of total acetone use.

Acetone is also one of the most widely used solvents in the world, and is found in many everyday products, including paints, cleaning fluids, nail polish remover, and adhesives. In these applications, use is often made of acetone's combination of high solvency with a high rate of evaporation. Acetone's listing as a non-volatile organic compound (VOC) in the US is increasing its use in coatings applications.

It is also used extensively in the manufacture of artificial fibres and as an intermediate in pharmaceuticals.

Health, Safety and Environmental considerations

Acetone has been shown to have a low potential for toxicity and does not pose a neurotoxic or reproductive health hazard at normal environmental concentrations. Prolonged skin contact can cause drying of the skin, which could result in a burning sensation or cracking. Immediate washing with water (and soap if available) will diminish its effects. Exposure to high vapour concentrations can cause eye irritation and those exposed should flush their eyes with water. Inhalation of high vapour concentrations can cause dizziness or nausea and lung damage. If acetone is ingested and then vomited, it can enter the lungs and cause lung damage. As a first aid measure, vomiting should not be induced and medical attention should be sought immediately.

The American Conference of Governmental Industrial Hygienists (ACGIH) has concluded that acetone is not classifiable as a human carcinogen. Also in the US, the National Toxicology Program (NTP) has recommended against the testing of acetone in cancer studies because of the absence of any evidence to support its carcinogenic potential.

Globally, occupational exposure levels for acetone range from 125 – 1000 ppm TWA (8-hour Time Weighted Average).

Acetone has low toxicity to aquatic organisms. It is readily biodegradable and has a low potential to bioaccumulate.

Acetone is an extremely flammable liquid whose vapours are heavier than air and can travel across terrain to remote ignition sources.

Acetone is naturally present in many fruits and vegetables, including grapes, onions and beans. Acetone is also "Generally Recognized As Safe" (GRAS) by the FDA when present in beverages, baked goods and desserts in concentrations from 5-8 mg/L.

Storing and transporting Acetone

Acetone is stored in carbon steel tanks with carbozinc 11 lining and equipped with floating roofs and double seals. Acetone is extremely flammable and must be handled carefully when transferring to and from storage tanks and transportation vehicles. Acetone may be transported by road, rail and sea.

The Acetone NF grade requires dedicated equipment and specific cleaning procedures as well as stringent controls throughout the whole supply chain.

Risk Characterization Summary

Risks associated with exposure to these products have been evaluated for the following "chain-of-commerce" activities: manufacture, storage, product transfer, transportation, and customers/markets. They are manufactured, stored and transported to customers in closed systems. Depending on the customer, end uses may vary from use as an intermediate for the manufacture other chemicals, commercial products, or certain formulated consumer products. Proper equipment design and handling procedures maintain low risk from exposure to acetone where the product is used as a chemical intermediate. Exposures may be higher in commercial and consumer applications. To minimize risk, additional controls, such as special handling procedures and protective packaging, are implemented.

This product stewardship summary is intended to give general information about the chemical or categories of chemicals addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the chemical's applicable Material Safety Data Sheet, which should be consulted before use of the chemical. This product stewardship summary does not supplant or replace required regulatory and/or legal communication documents.