Crotonaldehyde

KEY FEATURES:
- Readily soluble in the usual organic solvents
- Highly reactive intermediate

C₄H₆O

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Crotonaldehyde

PRODUCT DESCRIPTION

Crotonaldehyde, which is obtained by aldol condensation from acetaldehyde, is an almost colorless to pale yellow, highly flammable liquid with a lachrymatory effect and a pungent odor. It has poor solubility in water but is readily soluble in the usual organic solvents such as alcohols, ether and boiling point fractions of petroleum. In the presence of air, i.e., oxygen, crotonaldehyde tends first to form a peroxide and then to oxidize to form crotonic acid, whereas in the presence of mineral acids (traces) it tends to polymerize and, in the presence of alkalis on heating, it also tends to condense or resinify.

Crotonaldehyde combines with water at normal pressure to form an azeotrope containing about 25% water, boiling at 84°C. Because of its aldehyde function and the conjugated olefinic double bond within the aldehyde, crotonaldehyde can enter into numerous reactions and is, therefore, an important starting product for chemical synthesis. Crotonaldehyde acts as an effective solvent for numerous vegetable and mineral oils, fats, waxes, natural and synthetic resins as well as elementary sulphur.

APPLICATIONS

One of the main applications is as a precursor of fine chemicals. Sorbic acid, a food preservative, and trimethylhydroquinone, a precursor to the Vitamin E, are prepared from crotonaldehyde.

Crotonaldehyde is used for the manufacture of crotonic acid and is employed as a comonomer and a flow-promoting agent for alkyl resins. Crotaly alcohol, n-butanal and n-butanol are obtained by reduction of crotonaldehyde. With alcohols crotonaldehyde forms alkoxy butyraldehyde; for instance, with methanol it forms 3-methoxy butanal and, after hydrogenation, 3-methoxy butanol. Like Butoxyl® (3-methoxy-n-butylacetate), it is suitable for the use as a solvent. Crotonylidene ureas, which are used as slow-release fertilizers, are obtained as a result of the reaction of crotonaldehyde with urea. Other derivatives include crotonic acid and 3-methoxy butanol. Crotonaldehyde is also used in the production of thiophenes, quinaldines, pyridines, intermediates, dyes and pesticides.

Molar mass g/mol 70.09
Boiling point at 1013 hPa °C 102.2
Melting temperature °C -76
Refractive index nD at 20°C (DIN 51 423, Part 2) 1.436 – 1.438
Density at 20°C (DIN 51 757) g/cm³ 0.85
Water absorption at 20°C % (w/w) Approx. 9
Vapor pressure at 25°C hPa 40
Solubility in water at 20°C g/l 181