

Aldehydes:c2h4o

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Aldehydes: C₂H₄O Molecule Monmouth Aldehydes: C₂H₄O Molecule

Aldehyde is any organic compounds where the carbon atom shares a double bond with another oxygen atom, one bond with a group/ single atom or one bond with any hydrogen atom (Lewis, 2007). The double bond existing between the oxygen and carbon is a primary characteristic of all the aldehydes and is commonly referred to as carbonyl group. Most of the aldehydes feature a pleasant odour. Principally, they are derived from alcohols through dehydrogenation (the process of removal of hydrogen). It is this process that the name aldehyde originated. The paper looks at aldehydes, their structures, some examples of aldehydes and their use. A detailed examination of C₂H₄O molecule is provided as the main aldehyde under study (Lide, 2007).

Aldehydes pass through numerous chemical reactions, including polymerization. The combination of aldehydes with other types of molecules yielded the aldehyde condensation polymers. The polymers are used in plastics, for instance, Formica (laminated table top) and Bakelite (Bretherick, 1990). The aldehydes are also important for making perfumes, solvents, and intermediaries for the manufacture of pharmaceuticals and dyes. Some aldehydes are also included in the physiological processes. Some examples include pyridoxal phosphate (a basic form of Vitamin B₆) and retinal which is important in people's vision (called vitamin A aldehyde). The reducing sugars like glucose are also aldehyde. Others include synthetic and natural hormones (WHO, 2009).

Carbonyl Compounds Use

Some aldehydes are of great industrial importance and have been used as

flavouring agents, perfumes, and solvents. Some aldehydes are used as intermediaries in the manufacture of pharmaceuticals and dye. Some aldehydes naturally exist in the flavouring agents. These include benzaldehyde, which releases fresh almonds natural flavor and odour. Vanilla, the basic flavouring agent of the famous vanilla beans, oil of cinnamon or cinnamaldehyde (Mackison et al., 1981).

Additionally, some aldehyde performs essential functionalities in some living organisms and humans. For example, cellulose, starch, and sugars are based on compounds that have in them traces of ketone group and aldehydes long with hydroxyl groups. Others are steroid hormones like testosterone, progesterone, aldosterone, and cortisone that are ketones (Lide, 2007).

C₂H₄O/ Ethanal

Ethanol Profile:

Molecular Formula of ethanol: C₂H₄O

Average mass of ethanol: 44. 053 Da

Monoisotopic mass of ethanol: 44. 026215 Da

ChemSpider ID of ethanol: 172

Uses of C₂H₄O

The main use of acetaldehyde/ ethanol is as an intermediate in the manufacture of other chemicals.

Acetaldehyde/ ethanol are used in the process of production/ manufacture of perfumes, basic dye, and polyester resins. Acetaldehyde is also used as foods preservatives, fruit and fish preservative, as a denaturant for alcohol, as a solvent in the rubber, as a flavouring agent, in fuel compositions, for hardening gelatin, in paper industries and tanning.

Production Methods of C₂H₄O

The economics and technicality of the numerous processes used in the production of acetaldehyde are mainly dependent on the feedstock prices. Since 1960s, ethylene liquid-phase oxidation, has been the main process used in the manufacture of acetaldehyde (Lewis, 2007). However, there are still other methods used in industrial production of the molecules including the partial oxidation of ethyl alcohol and acetylene hydration. Acetaldehyde is also yielded in the as a co-product during oxidation of butane in very high temperatures. And more recently, the process of developing rhodium catalyzed yield acetaldehyde as an acetic acid and ethyl alcohol co-product from the synthesis of gas (Kirk-Othmer, 1991). Ethylene oxidation, ethanol vapor phase oxidation butane and propane vapor-phase oxidation and the catalytic reaction of H₂O and acetylene. Aldehyde can also be produced by alcohol oxidation with H₂SO₄ and Na₂Cr₂O₇, normally from dilute H₂SO₄, acetylene and mercury oxide as the primary catalyst, and also through passing alcohol vapour over some heated metallic catalyst (WHO, 2009).

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