



## glacial acetic acid

IUPAC Name Acetic Acid

Cas Number 64-19-7

HS Code 29152100

Formula CH<sub>3</sub>COOH

Industry

Food and Beverage

Textile

Basic Info

Appearance

Clear Colorless Liquid

Common Names

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Packaging

200 @ 10 kg Multi-layer Kraft Bag, 2 MT / 20'FCL

700 @ 30 kg drum, 21 MT / 20'FCL

### Brief Overview

Glacial Acetic acid is the undiluted form of acetic acid. Acetic acid, also known as ethanoic acid, has a molecular formula CH<sub>3</sub>COOH. It is a weak monoprotic acid which is able to lose a proton from its acid functional group (-COOH) readily and produce a conjugate base, acetate anion. Acetic acid is also a polar protic solvent as it dissolves readily and is miscible in other polar solvents such as water. However, its polar nature makes it insoluble and immiscible in non-polar solvents such as octane. Using acetic acid as a starting reagent, it readily forms other organic reagents such as acetyl chloride and ethanol through substitution and reduction reactions respectively. Acetic acid can also corrode metals such as iron, magnesium and zinc, forming hydrogen gas and metal acetates. But since aluminium forms a protective layer of aluminium oxide on its surface, it is acid-resistant and hence aluminium tanks are used as an option to transport acetic acid. Alternatively, high-density polyethylene (HDPE) drums can also be used to transport acetic acids as due to their resistivity.

### Manufacturing Process

Method 1: Carbonylation of Methanol

Acetic acid is manufactured via carbonylation of methanol. Metal carbonyl is added to methanol via rhodium-catalyzed Monsanto process or iridium-catalyzed Cativa process. However, with the introduction of iridium-catalyzed Cativa process, Monsanto process became obsolete. Due to the economic and



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environmental friendliness, Cativa process soon became the main process used to manufacture acetic acid.

### **Method 2: Acetaldehyde Oxidation**

Acetic acid is also manufactured via acetaldehyde oxidation, where oxidizing butane and hydrating ethylene via Wacker process obtain acetaldehyde. This crude acetaldehyde is purified by extractive distillation, followed by fractional distillation. This acetaldehyde will further oxidize to acetic acid.

### **Method 3: Oxidative Fermentation and Anaerobic Fermentation**

Acetic acid can also be manufactured via oxidative fermentation using acetic acid bacteria *Acetobacter* in alcoholic content, and via anaerobic fermentation using anaerobic bacteria *Acetobacterium*. The *Acetobacter* method remains more cost effective to produce acetic acid.

### **Food Industry**

In the food industry, acetic acid is used as an acidity regulator and as a condiment. Acetic acid is also used as a main ingredient for vinegar production. In food industry, acetic acid is also used as an antimicrobial and additives.

### **Intermediate Chemicals**

Acetic acid is used as a polar protic organic solvent for recrystallization and the production of purified terephthalic acid (PTA). This serves as a precursor and is in turn used to manufacture polyethylene terephthalate (PET), which is used to make clothing and plastics.

### **Other Applications**

Acetic acid helps in the breaking down of starches and sugars in table sugar, as well as sugar in milk. It is also used to manufacture vinyl acetate monomer, acetic anhydride and acetate ester, as well as purified terephthalic acid. In addition, Acetic acids are widely used for textile processing and printing. Acetic acids are used to synthesize acetic anhydride that serves as an acetylation agent and its major application is for cellulose acetate.