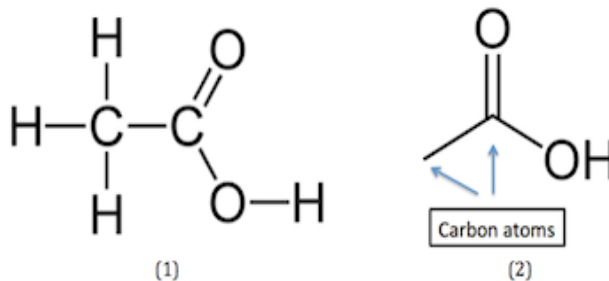


1. ACETIC ACID

Acetic acid, also known as **ethanoic acid** and **methanecarboxylic acid**

It is a colorless liquid that has a strong and distinct pungent and sour smell. Its chemical formula can be written multiple ways, as shown here:

- $C_2H_4O_2$
 CH_3COOH
 CH_3CO_2H



Vinegar is a household essential often used for cooking, and it even helps unclog sinks. What chemical substance makes vinegar smell the way it does? Vinegar is actually a solution that is made of 4-8% of acetic acid that is dissolved in water and other substances that give vinegar its flavor depending on its type.

Uses:

Ethanoic acid is a very important organic compound in the day to day lives of humans. Some of the important uses of acetic acid are listed below.

- Acetic acid is used as an antiseptic due to its antibacterial qualities
- The manufacture of rayon fibre involves the use of ethanoic acid.
- Medically, acetic acid has been employed to treat cancer by its direct injection into the tumour.
- Being the major constituent of vinegar, it finds use in the pickling of many vegetables.
- The manufacture of rubber involves the use of ethanoic acid. It is also used in the manufacture of various perfumes.
- It is widely used in the dimethyl pthalateion of VAM (vinyl acetate monomer).
- When two molecules of acetic acid undergo a condensation reaction together, the dimethyl pthalate formed is acetic anhydride.
- The desirable solvent properties of acetic acid, along with its ability to form miscible mixtures with both polar and non-polar compounds, make it a very important industrial solvent. It is widely used in the industrial preparation of dimethyl terephthalate (DMT).

2. LACTIC ACID

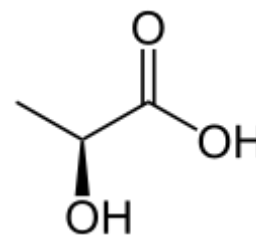
Lactic acid is known by many names, such as:

- DL-lactic acid
- 2-hydroxypropanoic acid
- 2-hydroxypropionic acid

Lactic acid has a viscous (syrupy) consistency. It's odorless and it is colorless or yellow. It is a liquid above 16.8 C (62.2 F) and forms crystals below this temperature.

Its **formula** is written out in one of two common ways:

- $C_3H_6O_3$
- $CH_3-CH(OH)-COOH$



Lactic acid is produced industrially, either synthetically or via fermentation. Fermentation involves using nutrients such as amino acids, peptides, vitamins, salts, glucose, sucrose, and lactose. Those nutrients are combined with microbes, which then use the nutrients to produce lactic acid.

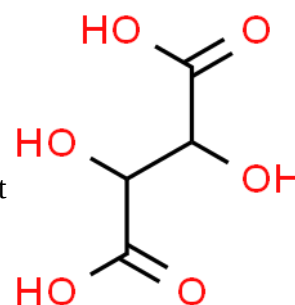
- Lactic acid creams can be used to treat dry, itchy, and scaly skin. Such creams act as a humectant and keratolytic.
- Lactic acid is used as a humectant, or moisturizer, in some cosmetics and as a mordant, a chemical that helps fabrics accept dyes, in textiles.
- It is also used in making pickles and sauerkraut, foods for which a sour taste is desired.
- Lactic acid is used in the dairy industry not only in making yogurt but in making cheese as well. It is also used in tanning leather.
- Lactic acid is important in the pharmaceutical industry as a starting material for other substances and is involved in the manufacturing of lacquers and inks.
- A related compound that is made from lactic acid is calcium stearoyl-2-lactylate, which is used as a food preservative.

3. TARTARIC ACID

Tartaric Acid is an acid found naturally in many plant species and the fruits they produce. chemical formula of Tartaric Acid – $C_4H_6O_6$. It is also known as 2, 3-Dihydroxybutanedioic Acid or L-(+)-Tartaric Acid.

Tartaric acid salts are called tartrates.

Tartaric acid is an organic substance that occurs naturally in various plants, fruits and wine. People have used it for many years in different ways.



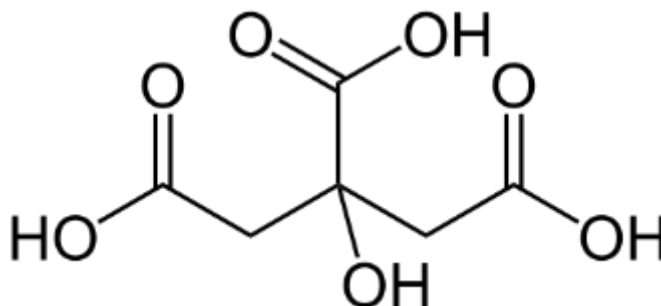
Uses:

- 1) It is a useful raw material in organic chemistry for the synthesis of other chiral molecules.
- 2) Used to make baking powder & cream of tartar.
- 3) Mostly used as ingredient in cosmetic & personal care dimethyl pthalates.
- 4) Used as a pH modifier in injectable formulations to achieve desirable pH of drug solubility, activity, absorption, stability & patient comfort.
- 5) Used in pharmaceutical to improve the taste of oral medications.
- 6) Expectorant in cough syrup.
- 7) Commercially, the food industry uses it as an additive and flavouring agent, and it is also employed in industries such as ceramics, textile printing, tanning, photography and pharmaceuticals
- 8) As an acidulant, tartaric acid has a taste that is naturally sour and gives foods a sharp, tart flavour.
- 9) Tartaric acid can also help set gels and preserve foods. It is often added to dimethyl pthalates like carbonated beverages, fruit jellies, gelatin and effervescent tablets.
- 10) It is also an ingredient in cream of tartar, found in hard candy and different brands of baking powder to make baked goods rise.
- 11) Industrial uses for tartaric acid include within the gold and silver plating process, cleaning and polishing metals, tanning leather and making blue ink for blueprints.
- 12) Tartaric acid is also an ingredient in Rochelle Salt, which reacts with silver nitrate to create the silvering on mirrors. Rochelle Salt is also a laxative, according to The Chemical Company.
- 13) Ester derivatives of tartaric acid can dye fabrics.

4. CITRIC ACID

Citric acid is an organic tricarboxylic acid which is an important metabolite in all animals and plants.

Formula and structure: The molecular formula of citric acid is $C_6H_8O_7$ and its molar mass is 192.12 g/mol. The chemical structure of citric acid is shown below. Citric acid is an alpha-hydroxy acid with a three carbon skeleton, which has three carboxylic acid groups (COOH), and one hydroxyl group (OH).



Occurrence: Citric acid occurs naturally in many fruits and vegetables, with the largest amounts in citrus fruits such as oranges, lemons and limes. It is also an important metabolic intermediate in the biochemical citric acid cycle and is present in all living things.

Preparation: Citric acid is mainly produced by the microbial fermentation of carbohydrates such as molasses, corn sugar, cane sugar, beet, etc. It is also extracted from citrus fruits as they contain up to 8% of citric acid.

USES

1. Citric acid has many uses in the food industry as a flavouring agent, pH modifier, and preservative.
2. It is also used as an anticoagulant and antioxidant, and in mineral supplements as citrate salts of metals.
3. It also finds uses in household cleaning solutions, as a pH buffer and as a water softener.
4. It is used as a cleaning agent – as an ingredient in kitchen and bathroom cleaning solution
5. It is used as an emulsifying agent in ice creams
6. It is used to add a sour taste to soft drinks and other food items
7. It used in shampoo
8. It is used in sucrose crystallization in caramel
9. It is used in food colouring
10. It is used as a natural preservative
11. It is used to remove the chalky deposit from evaporators, kettles, boilers etc.