

Pyruvic Acid (CAS N°: 127-17-3), also known as 2-oxopropanoic acid, α -ketopropionic acid or acetylformic acid, is the most important α -oxocarboxylic acid. It plays a central role in energy metabolism in living organisms.

It is a liquid with an acetic-acid smell and a melting point ranged between 11 and 12 °C. It is soluble in water.

It is stable under ordinary conditions, but it is air and light sensitive.

The synthesis route is using Tartaric acid as the main raw material.

Pyruvic acid is a very important compound involved in some very important biochemical processes. It occurs naturally as an intermediate product in carbohydrate and protein metabolisms in the body. The six-carbon glucose molecule is broken down to two molecules of pyruvic acid in aerobic condition as the main input for Krebs cycle, whereas to two molecules of lactic acid (alpha hydroxy acid) in anaerobic condition. Krebs cycle (also called citric acid cycle; tricarboxylic acid cycle) is a sequent process of enzymatic reaction which a two-carbon acetyl unit is oxidized to carbon dioxide and water to provide energy in the form of high-energy phosphate bonds.

Pyruvic acid is a key intersection in the network of metabolic pathways; it can be converted to carbohydrates via gluconeogenesis, to fatty acids or energy through acetyl-CoA, to the amino acid alanine and to ethanol. Therefore it unites several key metabolic processes.

Industrially, Pyruvic acid is an important product. It is mainly used to produce its salts and esters (pyruvates) for the use as dietary supplements of the effective weight loss enhancers. For instance, calcium pyruvate has a strong effect in reducing fat because it can accelerate the metabolism of fatty acids in the human body, and presently it serves as a fat burner in the food industry. Creatine pyruvate is also widely used as a dietary supplement, because of its performance-enhancing effect (to brain function and memory, to formation of bones and cartilage, to protect cells...)

It is also used as a starting material for the synthesis of pharmaceuticals, such as L-tryptophan, L-tyrosine, L-dihydroxyphenylalanine, L-phenylacetylcarbinol and N-acetyl-D-neuraminic acid as well as for the synthesis of amino acids (alanine, phenyl alanine for



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instance). Its derivatives are also employed to develop the production of crop protection agents, antioxidant, polymers, cosmetic agents, flavouring agents and food additives. The pyruvic acid derivative bromopyruvic acid is also being studied for potential cancer treatment applications.



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