



Lactic acid is an organic acid that plays a crucial role in various biological processes and is widely used in the food, pharmaceutical, and cosmetic industries. It is naturally produced in the body during anaerobic respiration and is found in fermented foods like yogurt and sourdough bread. Lactic acid is also a key ingredient in skincare products due to its exfoliating and hydrating properties.

Chemical Properties

1. **Structure:**

- Lactic acid is a hydroxycarboxylic acid with a hydroxyl group (-OH) and a carboxyl group (-COOH) attached to the same carbon atom, making it an alpha-hydroxy acid (AHA).
- It exists in two optical isomers: L-lactic acid (L-enantiomer) and D-lactic acid (D-enantiomer), with L-lactic acid being the form commonly found in the human body.

2. **Solubility:**

- Lactic acid is highly soluble in water, which makes it easy to incorporate into aqueous formulations for various applications.
- It is also soluble in ethanol and other polar organic solvents, although it is less soluble in non-polar solvents.

3. **Acidity:**

- Lactic acid is a weak acid with a pKa of approximately 3.86, indicating that it partially dissociates in water to release hydrogen ions (H⁺), contributing to its acidic nature.
- Its acidity allows it to lower the pH of solutions, making it useful in products designed to exfoliate the skin or preserve food.

4. **Hygroscopic Nature:**

- Lactic acid is hygroscopic, meaning it has the ability to attract and retain moisture from the environment. This property makes it valuable in skincare products for its moisturizing and humectant effects.

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