



**Sorbitol** is a sugar alcohol (polyol) that is widely used as a

sweetener, humectant, and texturizer in various industries, including food, pharmaceuticals, and cosmetics. It occurs naturally in fruits like apples, pears, and berries, and can also be synthesized industrially from glucose. Sorbitol is valued for its sweet taste, moisture-retaining properties, and low glycemic index, making it a popular ingredient in sugar-free and diabetic-friendly products.

## **Chemical Properties of Sorbitol:**

### **1. Molecular Structure:**

- Sorbitol, also known as glucitol, has the chemical formula  $C_6H_{14}O_6$ . It is a hexitol, meaning it contains six carbon atoms, each bonded to a hydroxyl group (-OH).
- Structurally, it is similar to glucose but with an alcohol group (-OH) replacing the aldehyde group (-CHO) of glucose, which makes it a sugar alcohol.

### **2. Physical Appearance:**

- Sorbitol is a white, crystalline powder or a syrupy liquid, depending on its concentration and form. It is odorless and has a sweet taste, though it is less sweet than sucrose (table sugar).

### **3. Solubility:**

- Sorbitol is highly soluble in water, which makes it easy to incorporate into various formulations, especially in liquid and semi-liquid products like syrups and gels.
- It is also slightly soluble in ethanol but insoluble in most organic solvents like ether.

### **4. Sweetness:**

- Sorbitol has about 60% of the sweetness of sucrose, making it a milder sweetener. This lower sweetness level is beneficial in applications where a less intense sweet flavor is desired.
5. Humectant Properties:
- Sorbitol is a potent humectant, meaning it can attract and retain moisture. This property is crucial in the formulation of products like cosmetics, where it helps to keep the skin hydrated, and in food products, where it helps maintain moisture content and extend shelf life.
6. Low Glycemic Index:
- Sorbitol has a low glycemic index, meaning it causes a slower and lower rise in blood glucose levels compared to regular sugars. This makes it suitable for use in products aimed at diabetics or those looking to manage blood sugar levels.
7. Stability:
- Sorbitol is stable under heat and acidic conditions, making it suitable for use in a wide range of food processing and pharmaceutical applications. It does not caramelize or degrade easily, even at elevated temperatures.