# Sodium Benzoate

is a widely used preservative in food, beverages, cosmetics, and pharmaceuticals. It is the sodium salt of benzoic acid and is particularly effective at inhibiting the growth of bacteria, yeast, and fungi, thereby extending the shelf life of various products.

## Chemical Properties

1. **Appearance:**
   - Sodium benzoate is a white, crystalline powder or granules, and is odorless or has a slight, sweetish odor.
2. **Solubility:**
   - Sodium benzoate is highly soluble in water, with solubility increasing as the temperature rises (about 62.7 g/100 mL at 20°C). It is also soluble in alcohol but less so in organic solvents like ether.
3. **Melting Point:**

- Sodium benzoate has a melting point of about 300°C (572°F) when it decomposes.

4. **pH:**
   - Sodium benzoate is most effective as a preservative in acidic environments (pH 2.5 to 4.0). In neutral or alkaline conditions, its preservative action diminishes. When dissolved in water, it typically forms a slightly alkaline solution.
5. **Reactivity:**
   - Sodium benzoate is stable under normal conditions but can react with strong acids to produce benzoic acid, which is the active preservative form.
6. **Antimicrobial Activity:**
   - Sodium benzoate's effectiveness as a preservative is due to its ability to inhibit microbial growth. It works primarily by interfering with the metabolism of micro