

Tikrit university college of pharmacy



Inorganic Pharmaceutical Chemistry

Lab6 } Assay of sodium benzoate {

By

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Introduction

- Sodium benzoate ($C_7H_5NaO_2$, m.wt.= 144.1) is a white, crystalline or granular powder or flakes. It is slightly hygroscopic, freely soluble in water, and sparingly soluble in alcohol. The powder when dried contains not less than 99 % of sodium benzoate. Sodium benzoate has antibacterial and antifungal properties. It is used as a preservative in pharmaceutical formulations including oral preparations in concentrations up to 0.5%. Sodium benzoate is also a common ingredient of cough syrup.

Common uses of sodium benzoate

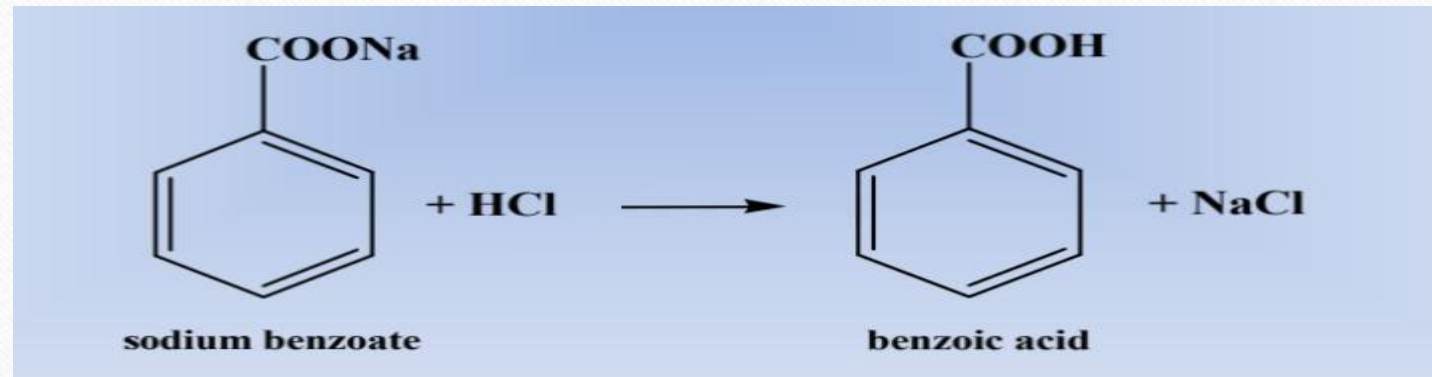
- Food. In the food industry, sodium benzoate is used to prevent spoilage from harmful bacteria, yeasts, and molds. It also helps maintain freshness in food by helping to slow or prevent changes in color, flavor, PH, and texture.
- Cosmetics. Like food and drink products, cosmetics also need preservatives to prevent the growth of bacteria. Preservative-free, natural products cannot be stored for a long time. such as: Mouthwash, Hair products, Sunscreen, Moisturizers, Serums

Common uses of sodium benzoate

- **Toothpaste.** To inhibit the growth of microorganisms in toothpaste, producers usually add a certain amount of preservatives. When considering the antimicrobial effect, safety, and price, sodium benzoate is often the better choice compared with other commonly used preservatives in toothpaste.
- **Pharmaceuticals.** Sodium benzoate can also be used in pharmaceutical products for its antimicrobial properties, such as in the formulation of tablets, capsules, and cough syrup.

Chemical principle

Sodium benzoate is a salt derived from a weak acid and a strong base, so its aqueous solution is alkaline. Therefore, solutions containing sodium benzoate are assayed using a standard N/2 hydrochloric acid solution in an acid- base titration.

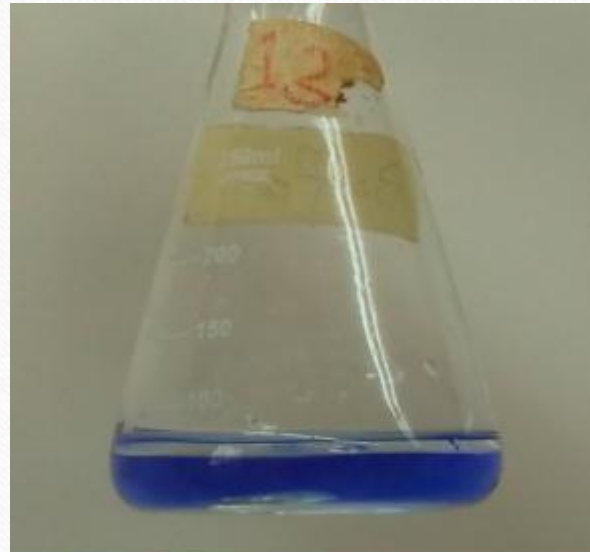
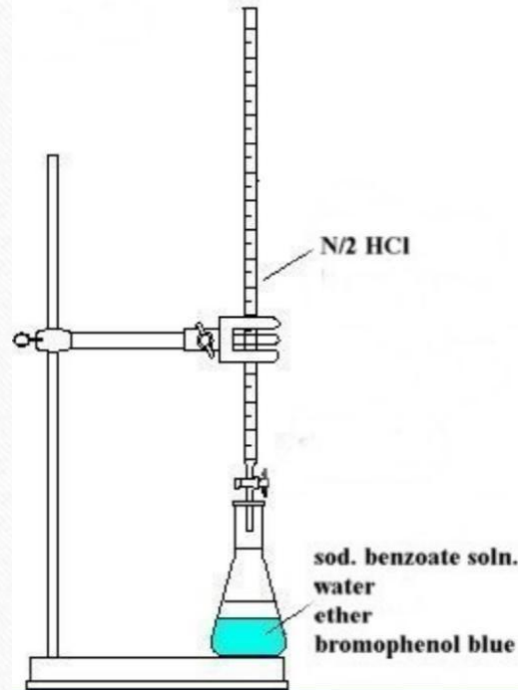


Procedure

- wash the burette with the D. W. And the titrant (HCl)

- fill the burette burette with N/2 HCl to a level adjust it
- put 10 mL of an unknown sodium benzoate solution in a clean conical flask
- add 25mL of D. W. And 15mL of ether
- add 6 drops of bromophenol blue
- start titration by adding HCl drop wise with shaking the aqueous and ethereal layers until a light green colour persists in the aqueous layer (end point) record the volume of HCl used

Titration process



**start point
(violet - blue)**



**end point
(bluish green)**

Calculation

- Calculate the chemical factor: each 1 mL of N/2 hydrochloric acid is equivalent to 0.07205g of $C_7H_5NaO_2$ (correct the volume of HCl solution used into N/2 volume)
calculate the quantity of sodium benzoate present in your sample
calculate the percentage w/v of your sodium benzoate sample