

# Determination of sodium benzoate in fruit juice



# Preservatives

- A substance which when added to food is capable of inhibiting, retarding or arresting the process of **fermentation**, acidification or other decomposition of food.
- Used to **prevent and retard the microbial spoilage** of food.



# Examples of preservatives

- Benzoic acid
- Sodium benzoate
- Potassium benzoate
- Sorbic acid
- Potassium sorbate
- Propionic acid
- Sodium propionate
- Calcium propionate

*"Preservatives preserve food,  
they don't preserve you".*



- The **inhibitory action** of preservatives is due to their **interfering with the mechanism of cell division, permeability of cell membrane and activity of enzymes.**

SCARY SEVEN: INGREDIENT  
**PRESERVATIVES**



REPORTED  
**SIDE EFFECTS**  
INCLUDE

**HEADACHES**  
**TINITUS** LIVER &  
**CANCER** KIDNEY  
DAMAGE  
**SKIN RASHES**  
**VOMITING** NAUSEA  
**INFERTILITY**  
ALLERGIC REACTIONS



**PRESERVATIVES**  
USED TO PROLONG PRODUCT SHELF LIFE

ALWAYS  
**READ** *the* **LABEL**

**PRESERVATIVES**  
FOUND TO CAUSE  
**THE MOST**  
**HARM ARE**



Propyl  
Gallate  
VEGETABLE  
OIL



TBHQ  
FROZEN FISH  
& SOME  
CHOCOLATES



Sodium Benzoate  
SODA/POP



BHA/BHT  
CEREAL



Polysorbates  
60, 65 & 80  
ICE CREAM



Potassium  
Sorbate  
COTTAGE CHEESE,  
MARGARINE



Nitrates  
BACON,  
SAUSAGES



Sulfites  
RED WINE,  
BALSAMIC VINEGAR



naturallysavvy.com™

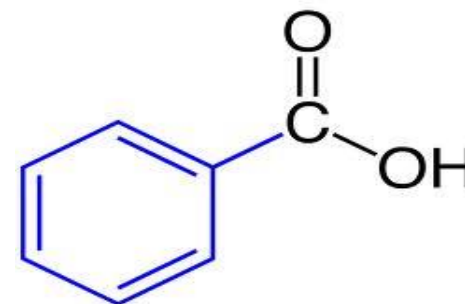


FACEBOOK.COM/NATURALLYSAVVY

LEARN MORE AT [NATURALLYSAVVY.COM/CHALLENGES](http://NATURALLYSAVVY.COM/CHALLENGES)

# Sodium benzoate

- Sodium benzoate (MW = 144) is a **preservative**. As a food additive, sodium benzoate has the E number E211.
- It is bacteriostatic and fungistatic.
- It is most widely used in acidic foods such as salad dressings (vinegar), carbonated drinks (carbonic acid), jams and fruit juices and pickles (vinegar).
- It is also used as a preservative in medicines.



# Sodium benzoate

- When added in high concentration it **affects the taste of juice**.
- Sodium benzoate is usually permitted at a concentration of up to 1.3 g/l of juice. (**not exceed 0.13 %**)



# Objective

To estimate the concentration of benzoate in fruit juice.

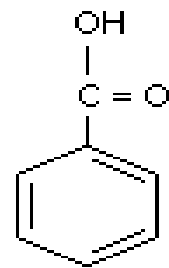


# Principle

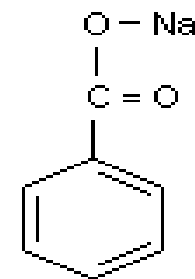
The **benzoate anion** is **not soluble in non-polar solvents** because of its negative charge.

However, in **acid solution**, **benzoic acid is formed**. This is neutral & quite non-polar.

Moreover, it is **soluble in non-polar solvents**.



Benzoic acid



Sodium benzoate



# Principle-continue

- Benzoic acid is **separated** from a known quantity of the sample **by saturating with NaCl** and then acidifying with dilute HCl and **extracting with chloroform**.

- The chloroform layer is made mineral acid(inorganic acid) free and the solvent is removed by evaporation. The residue is dissolved in neutral alcohol and the amount of benzoic acid is determined by titration against standard alkali (0.05 M NaOH) using phenolphthalein as an indicator.

## Method:

- Weight **10 g of sample** into a beaker and add 1 ml of 10% **NaOH** solution and 12 g **NaCl**.
  - Add sufficient water to bring the vol. up to about 50 ml and let it stand for 30 min. with frequent shaking.
  - Add 1 drop of ph.ph (the color will change), add drops of **HCl** until the color change (disappear), then add excess 3 ml **HCl**.
  - Add 25 ml of **chloroform**.
  - Transfer into **separator funnel**. Let it stand for 20 min with frequent shaking.
  - Transfer 12.5 ml of the chloroform layer (**lower layer**) into a **conical flask** and evaporate of the chloroform on a steam bath.
  - Add 50 ml of 50% **ethanol** solution.
  - **Titrate** with 0.05 M NaOH add 1 drops of ph.ph as indicator (colorless in acidic).
- Calculate the amount of sodium benzoate in the sample.

## Calculation:

1 ml of 0.05M NaOH  $\longrightarrow$  0.0072 g sodium benzoate

..... ml NaOH  $\longrightarrow$  ? gm of sodium benzoate

% of sodium benzoate = (wt. of sodium benzoate / wt. of sample) X 100

- Normal range not exceed 0.13 %