PRACTICES

1.1.1 Quantity Determination of acetylsalicylic acid (Aspirin)

Dissolve 0.5 g of acetylsalicylic acid in erlenmeyer flask by addition of 20 ml of 90% ethanol and titrate with 0.5 N NaOH standart solution (a ml) using phenolphthalein as an indicator until the solution has a light pink color.

The aspirin/NaOH acid-base reaction consumes one mole of hydroxide per mole of aspirin. The slow aspirin/NaOH hydrolysis reaction also consumes one mole of hydroxide per mole of aspirin, and so for a complete titration we will need to use a total of twice the amount of NaOH (2a ml) that you have already used, plus we will add some excess NaOH to ensure we really have reacted with all of the aspirin in the sample.

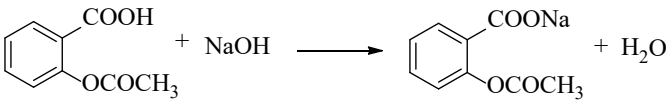
Heat gently the flask contents in a water bath. After 15 minutes, remove samples from the water bath and cool for 5 minutes. The only base remaining in each flask will be excess base that has not reacted with the aspirin. Titrate the excess base with 0.5 N HCl solution until the pink color just disappears.

Calculations for acetylsalicylic acid:

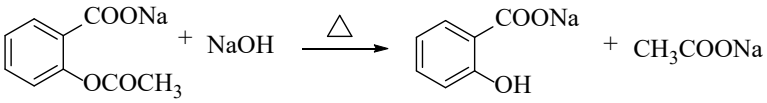
1 ml	0.5 N NaOH	45.05 mg acetylsalicylic acid
[2a . fNaOH – b . fHCl]	0.5 N	x

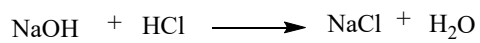
$$\frac{x \cdot 100}{T} = \%\ \text{acetylsalicylic acid}$$

Reaction equation:



aspirin





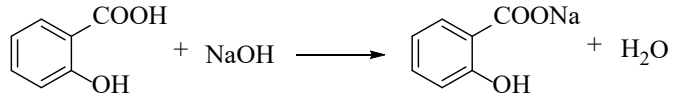
(excess)

Calculations for salicylic acid:

1 ml	0.5 N NaOH	69 mg salicylic acid:
[a . fNaOH – (2a . fNaOH - b . fHCl)]	0.5 N	x

$$\frac{x \cdot 100}{T} = \%\ \text{salicylic acid:}$$

Reaction equation:



salicylic acid

1 N HCl Solution

1N HCl solution contains 36.5 g of HCl in the volume of 1000 ml. (HCl M.W. = 36.5).

Preperation of 0.5 N HCl solution:

Take 41.5 ml of 37% (d = 1.19 g/ml) HCl solution and complete the volume to 1000 ml with water.

Adjustment:

1.5 g of anhydrous and pure sodium carbonate (primary standart) previously dried up to 270 °C is dissolved in 100 ml of water. Add two drops of methyl red and titrate with 0.5 N HCl until the solution has a light pink color. Carrefully heat for providing output of carbon dioxide. Then, continue titration until the pink color reappears.

1 ml 0.5 N HCl solution is equivalent to 26.495 mg of anhydrous sodium carbonate

1 N NaOH solution

1 N NaOH solution contains 40 g of NaOH in the volume of 1000 ml. (NaOH M.W. = 40.0).

Preperation of 0.5 N NaOH solution

Take 20 g of NaOH and complete the volume to 1000 ml with water.

Adjustment:

1- 5 g of 3-hours dried pure potassium hydrogen phthalate at 105 °C is dissolved in 75 ml of boiled, CO_2-free distilled water. Add two drops of phenolphthalein and titrate with 0.5 N NaOH until until the solution has a light pink color.

1 ml 0.5 N NaOH solution is equivalent to 102.1 mg potassium hydrogen phthalate

2- The standart hydrochloric acid solution can also be used to adjust the sodium hydroxide solution.25 ml of NaOH solution is titrated with 0.5 N HCl solution using phenolphthalein as an indicator until the color disappears.