

LAB: #3

DATE: 25th September, 2007

TITLE: Analyzing Iron Tablets

OBJECTIVE: To determine the content of iron in iron tablets by titration.

MATERIALS:

1. goggles and lab coat
2. 2 125cm³ conical flask
3. 1 250cm³ standard volumetric flask
4. 1 50cm³ burette
5. safety filler and pipette
6. 1 stand and clamp
7. filter funnel
8. Bunsen burner kit

Chemicals

1. Iron tablets
2. 1.0mol dm⁻³ sulphuric acid (200cm³)
3. 0.01mol dm⁻³ Potassium Per Manganate
4. Distilled water/ wash bottles
5. soap solution

PROCEDURES:

Making a solution of the tablets

1. 5 iron tablets were weighed accurately, and then dissolved in about 100cm³ of 1.0 mol dm⁻³ sulphuric acid in a conical flask. Some heating was required, but not more than the necessary needed to dissolve the tablets.
2. The mixture was filtered into a beaker, making sure that no solution was lost, then the conical flask was washed out with water and the washings were poured through the filter.
3. Finally, distilled water was poured over the residue and these washings were collected as well. The filtrate was then poured into a 250cm³ standard volumetric flask, washing out the beaker and adding washings to the standard flask. The mark was made up using distilled water.

Titration with Potassium Manganate (VII)

1. Using a pipette (safety) filler, 25cm³ of the iron (II) solution was pipette from the volumetric flask into a conical flask.
2. About 25cm³ of 1.0 mol dm⁻³ sulphuric acid was added and titrated with 0.01 mol dm⁻³ Potassium Manganate (VII) solution.

3. The experiment was repeated until two coincident results were obtained.

OBSERVATIONS, RESULTS, DATA:

Description	Initial Reading	Final Reading	Volume of HCl
Rough	0	12.5	12.5
First Titration	12.5	23.2	11.3
Second Titration	23.2	35.2	12.0
Average	7.5	15.3	7.7

**TABLE SHOWING RESULTS OF IRON TABLET SOLUTION AND
POTASSIUM MANGANATE (VII) TITRATION**

CALCULATIONS:

To calculate the amount of iron dissolved in volumetric flask

Iron + sulphuric acid → iron sulphate + hydrogen gas



Concerned with 1 mole of iron sulphate produced from 1 mole sulphuric acid

$$\begin{aligned}\# \text{ of moles of H}_2\text{SO}_4 &= \text{volume}/1000 \times \text{concentration} \\ &= 100/1000 \times 1.0 \\ &= 0.1 \text{ mol of H}_2\text{SO}_4\end{aligned}$$

1 mole iron sulphate produced from 1 mole sulphuric acid
 $x \qquad \qquad \qquad 0.1$

hence $x = 0.1 \text{ mol}$

volume of solution = 100cm³
volume of solution with water = 250cm³
dilution = 250/100 = 25

$$\begin{aligned}\# \text{ of moles of FeSO}_4 &= 0.1 \times 25 \\ &= 2.5 \text{ moles of FeSO}_4 \text{ (original amount)}\end{aligned}$$

To calculate the amount of iron left over after titration

Iron + sulphuric acid → iron sulphate + hydrogen gas



Concerned with

DISCUSSION:

CONCLUSION: The percentage of 2-ethanoylhydroxybenzoic acid (acetylsalicylic acid) in aspirin tablets was found to be 51.3%. The hydrolysis of aspirin tablets was also successfully completed by using sodium hydroxide base. The conclusions drawn are not as accurate as expected due to the high difference in percentage of acetylsalicylic acid content found compared to that given.

Analyzing Iron Tablets

Assessment: (M/M)

Mark Scheme

Weighing

- Zero before weighing [1]

Heating

- Use of proper attire (apron/goggles)
- Heat slowly
- readjusting flame to proper height/color

(any 2 – 1 mark; all 3 – 2 marks)

Measuring Volume

- Measuring Cylinder: On a flat Surface

read bottom of meniscus [1]

- Volumetric flask: fill to the mark [1]

Pipette: Rinse with required solution [1]

Touch top of pipette to surface liquid [1]

Proper use of pipette filler [1]

- Burette: rinse with required solution

Use funnel to fill burette

Nozzle free of air bubbles.

(any 3- 1 mark; any 4- all 2 marks)

Total = _____