Signature of the teacher

Experiment no : **DATE:**

Determination of Percentage of Copper in Brass using standardSodium thiosulphate solution.

PRINCIPLE: The chief constituents of Brass alloy are Copper and Zinc. It also contains small quantities of Tin, Lead and Iron. The percentage composition of a typical Brass is Copper; 50-90. Zn; 20-40, Tin; 0-6, Lead; 0-2 Iron; 0-1

A solution of Brass is made by dissolution of the sample in Nitric acid. Excess of acid is neutralized by Urea and ammonium hydroxide. The solution is changed to weak acidic medium by adding acetic acid. Potassium iodide is added. Iodine is liberated by cupric ions. Then the solution is titrated against sodium thiosulphate solution using starch as indicator. The amount of sodium thiosulphate consumed is the measure of amount of copper present.

$$2CuSO_4 + 4KI \quad Cu_2I_2 + 2K_2SO_4 + I_2$$

$$2Na_2S_2O_3 + I_2 \quad 2NaI + Na_2S_4O_6$$

PROCEDURE:

PartA: Preparation of Brass solution:

Weigh exactly the given sample of brass into a clean 250cm^3 conical flask. Add concentrated Nitric acid drop by drop untilthe brass dissolves completely. Add 2tt of distilled water and about 1 gram of Urea. Boil for about two minutes to destroy oxides of nitrogen. Cool the mixture.

Part B: Estimation of copper in brass solution.

Add 1tt of distilled water to the solution obtained in part A. Add ammonium hydroxide drop by drop until a pale blue ppt. is obtained. Dissolve the ppt. by adding dilute acetic acid drop by drop, followed by ¼ tt of acetic acid and 1 tt of 10% KI solution. Swirl the conical flask thoroughly for about 30 seconds. Titrate the liberated iodine against standard sodium thiosulphate solution taken in the burette until the solution becomes pale yellow or cream coloured. Add about 2cm^3 of freshly prepared starch solution as indicator. Continue the titration by adding sodium thiosulphate solution strictly drop by drop until the dark blue colouration disappears, leaving behind white ppt.

Repeat part A and B to conduct a duplicate. Calculate the percentage of copper present in the brass samples.

REPORT:

Trial	Weights of brass taken in grams	Percentage of copper
1		
2		

Experiment no:

Observation and Calculations

Part A: Preparation of brass solution

Trial	I	II
Weight of brass + weighing bottle	g	g
Weight of empty weighing bottle	g	g
Weight of brass	g	g

Part B: Estimation of copper in brass sample

Burette :Standard sodium thiosulphate solution
Conical flask :Brass solution + Ammonium hydroxide till bluish white precipitate
+1/4 test tube of acetic acid +1 test tube of 10% potassium iodide solution
Indicator :2 cm^3 of freshly prepared starch indicator when the solution turns pale yellow.
End point :Disappearance of dark blue colour

Trials Burette readings	I	II
Final reading		
Initial reading		
Volume of $Na_2S_2O_3$ run down in cm^3		

Trial 1

1000cm^3 of 1N $Na_2S_2O_3$ solution = 63.54 g of Copper

Therefore Vcm^3 of 1N $Na_2S_2O_3$ = $\frac{X \times V \times 63.54}{1000}$ (a g)

Weight of brass taken=W=---------- g

Percentage of Copper in brass= $\frac{a \times 100}{W}$ = ---------- g of copper

Trial 1I

1000cm^3 of 1N $Na_2S_2O_3$ solution = 63.54 g of Copper

Therefore Vcm^3 of 1N $Na_2S_2O_3$ = $\frac{X \times V \times 63.54}{1000}$ (a g)

Weight of brass taken =W = ---------- g

Percentage of Copper in brass= $\frac{a \times 100}{W}$ = g of copper

Result: Percentage of Copper in brass= Trial I

Trial II

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