

Date: _____

Sun Mon Tue Wed Thu Fri Sat

Section A

Question 1

i. Apparatus

- A : Volumetric flask
 B : pipette
 C : Burette
 F : ~~Conical~~ Conical flask.

ii	Initial Reading	Final Reading	Volume used (cm^3)
	3.2 cm^3	17.4 cm^3	14.2 cm^3
	17 6.5 cm^3	20.8 cm^3	14.3 cm^3
	9.7 cm^3	24.1 cm^3	14.4 cm^3

$$\text{Mean volume of HCl used} = \frac{14.2 + 14.3 + 14.4}{3}$$

$$= 14.3 \text{ cm}^3$$

- iii
- $n_1 = 1$ (Na_2CO_3)
 - $n_2 = 2$ (HCl)

Given Volume of Na_2CO_3 sol. = $V_1 = 10 \text{ cm}^3$

Mean volume of HCl = $V_2 = 14.3 \text{ cm}^3$

$n_1 = 1$ (Na_2CO_3)

$n_2 (\text{HCl}) = 2$

Molarity of $\text{HCl} = 0.1 \text{ M}$

Required : Molarity of $\text{Na}_2\text{CO}_3 = M_1 = ?$

Formula:

COPY
the
text

By re-arranging, we get

$$M_1 = \frac{M_2 V_2 \cdot n_1}{V_1 \cdot n_2}$$

Solution

$$M_1 = \frac{0.1 \times 14.3 \times 1}{10 \times 2}$$

$$M_1 = \frac{1.43}{20}$$

$$M_1 = 0.07165 M$$

Result:

Molarity of Na_2CO_3 is $0.07165 M$

Section B

Question 2

- i. A given organic compound 'X' gives a positive Bayer's test (Reaction with KMnO_4). Mention the Change Observed for this test.

A: A positive Bayer's test indicates the presence of unsaturation (double or triple bonds)

Change Observed: decolorization of KMnO_4 solution to a brown MnO_2 (manganese dioxide) precipitate.

- ii. When an unknown salt is subjected to a flame, a crimson red flame is obtained. Give procedure of the test and indicate the cation which gave the red flame.

Procedure:

- i. Dip a nichrome
- i. Dip a nichrome or platinum wire in Conc. HCl acid and hold it in a flame to clean it.
- ii. Take a little of the salt solution paste on the loop of the wire and hold it in the flame and observe.

Observation

A crimson red flame indicates the presence of Sr^{+2} i.e. strontium cation.

iii. When sugar decomposes on heating. Write the product of decomposition and write observation of the exp.

A. When sugar is heated, after melting it first gives yellow color, then turns brown and finally black.

It releases steam i.e water vapour and gives off burnt caramel smell/odor.

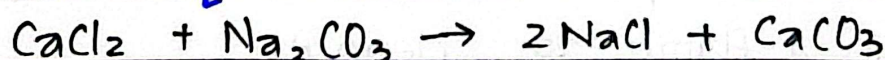
Products of decomposition

- Water (H_2O)
- carbon (C)
- volatile compounds

iv. The purpose of the experiment is to remove the hardness of water containing $CaCl_2$. Write a method with a chemical equation to remove it.

Method: $CaCl_2$ Hardness can be removed by adding Sodium Carbonate.

Chemical Equation:



Observation

Calcium Carbonate precipitates are seen when sodium carbonate is added to hard water. This can be filtered out and thus we are left with clean soft water.