

Acetation

Burette

Blank titration

### Record of Observations:

Weight of bleaching powder = 1 g

Part A: Estimation of % of available  $\text{Cl}_2$  in (Back titration)

Solution in Burette: std.  $\text{Na}_2\text{S}_2\text{O}_3$  solution

Solution in Conical flask: 25cc of bleaching powder solution

+ 5ml of conc.  $\text{CH}_3\text{COOH}$  +

1.0g of KI

Indicator Used : Starch

Colour Change : Blue colour disappears.

Tabulation: ~~addulas~~ ~~the app do~~ ~~skipped~~

Burette levels	I	II
Final level	8.2	16.8
Initial level	0	8.2
Difference ( $V_1$ )	8.2	8.6

Part B: Estimation of % of available  $\text{Cl}_2$  in (Blank titration)

Solution in Burette: std.  $\text{Na}_2\text{S}_2\text{O}_3$  solution

Solution in Conical flask: 25cc of distilled water + 5ml of conc.  $\text{CH}_3\text{COOH}$  + 1.0g of KI

Indicator Used : Starch

Colour Change : Blue colour disappears.

Burette levels :	I	II
Final level :	0	0
Initial level :	0	0
Difference ( $A_1$ ) :	0	0

TITRIS

Estimation of percentage of available chlorine in the given sample of bleaching powder (Iodometric method)

Principle: Bleaching powder reacts with iodide ions to liberate chlorine which in turn liberates iodine from potassium iodide solution.

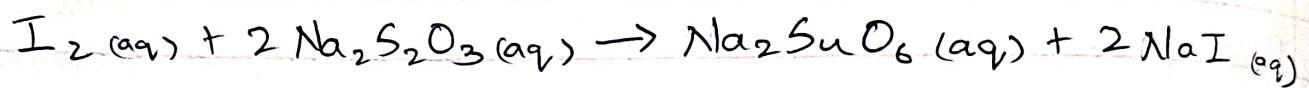
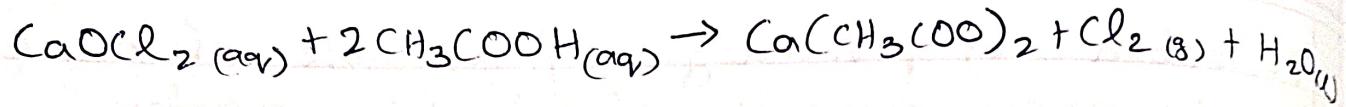
Bleaching powder is commonly used as a disinfectant. The chlorine present in the bleaching powder get reduced with time. So, to find the exact quantity of bleaching powder required, the amount of available chlorine in the sample must be found out. Chlorine will liberate free iodine from potassium iodide solution when its pH is 8 or less. The iodine liberated, which is equivalent to the amount of active chlorine, is titrated with standard sodium thiosulphate solution using starch as indicator.

- $\text{CaOCl}_2 \text{ (aq)} + 2\text{CH}_3\text{COOH} \text{ (aq)} \rightarrow \text{Ca}(\text{CH}_3\text{COO})_2 + \text{Cl}_2 \text{ (g)} + \text{H}_2\text{O}$
- $\text{Cl}_2 \text{ (g)} + 2\text{KI} \text{ (aq)} \rightarrow 2\text{KCl} + \text{I}_2 \text{ (g)}$
- $\text{I}_2 \text{ (aq)} + 2\text{Na}_2\text{S}_2\text{O}_3 \text{ (aq)} \rightarrow \text{Na}_2\text{S}_4\text{O}_6 \text{ (aq)} + 2\text{NaI} \text{ (aq)}$

Procedure:

Dissolve 1 g bleaching powder in 1 lt of distilled water in a volumetric flask, and stopper the container. (This can be done by first making a paste of the bleaching powder with pestle & mortar.)

Teacher's Signature : \_\_\_\_\_



Calculations:

Equivalents of  $\text{Na}_2\text{S}_2\text{O}_3$  = Equivalents of  $\text{Cl}_2$

$$\text{mg of Cl}_2/\text{ml} = (N \times V) \text{ Na}_2\text{S}_2\text{O}_3 \times \frac{\text{Equivalent weight of Cl}_2}{\text{Volume of bleaching powder}}$$

$$= (V_1 - A_1) \times N (\text{Na}_2\text{S}_2\text{O}_3) \times \frac{\text{Equivalent weight of Cl}_2}{\text{Vol of bleaching powder}}$$

$$= \frac{8.8 \times 0.025 \times 35.46}{25}$$

$$B = 0.312 \text{ mg/ml}$$

$$\% \text{ of chlorine available in given sample of bleaching powder} = \frac{B \times 100}{\text{Weight of bleaching powder}}$$

$$= 31.2 \%$$

Place 5 mL acetic acid in an flask and add about 1 g potassium iodide crystals. Pour 25 mL of bleaching powder solution prepared above and mix with a stirring rod. Titrate with 0.025 N sodium thiosulphate solution until a pale yellow colour is obtained. (Deep yellow changes to pale yellow). Add 1 mL of starch solution and titrate until the blue colour disappears. Note down the volume of sodium thiosulphate sol added ( $V_1$ ). Take a volume of distilled water corresponding to the sample used. Add 5 mL acetic acid, 1 g potassium iodide and 1 mL starch solution. If blue colour occurs, titrate with 0.025 N sodium thiosulphate solution until blue colour disappears. Record the volume of sodium thiosulphate solution added ( $A_1$ ). If no blue colour appears, titrate with 0.025 N iodine solution until a blue colour appears.

Note down the volume of iodine ( $A_2$ ). Then, titrate with 0.025 N sodium thiosulphate solution till the blue colour disappears. Record the volume of sodium thiosulphate solution added ( $A_3$ ). Note down the difference between  $A_2$  &  $A_3$  as  $A_u$ . ( $A_u = A_2 - A_3$ )

Note: Blank titration is necessary to take care of the oxidising or reducing reagents' impurities.

### Results:

Percentage of available  $\text{Cl}_2$  in the given sample of bleaching Powder = 31.2%

$$\frac{5}{5} + \frac{5}{5} + \frac{5}{5}$$

Teacher's Signature : 