

ANALYSIS PROCEDURE - HYDROCHLORIC ACID

- (1) Sp. gr., Temp: Refer Chart to know concentration.
- (2) Determination of total Acidity : Weigh the sample in weighing bottle. Transfer the sample to a conical flask and dilute to 100 ml with water. If the sample was weighed in the ampoule, place it into the conical flask containing 200 ml of cold water. Stopper the flask, shake to break the ampoule containing the test portion. Shake the conical flask until the vapours are completely absorbed. Remove the stopper and rinse it with water. Collect the washings in the conical flask.

Add two drops of Methyl Orange indicator to the solution in the conical flask and titrate to the end point with standard Sodium Hydroxide solution.

Total acidity (as HCl) percent by mass = $(V \times N \times 3.646) / M$.

V = Volume in ml of standard Sodium Hydroxide solution
Used in titration

N = Normality of standard Sodium Hydroxide solution

M = Mass in grams of the sample taken for the test.

- (3) Determination of Iron : Take sample (volume should be proportionate to the Colour of the sample) in a breaker. Add a pinch of Ammonium Persulphate and boil well, cool, add 10 ml of 10% KCNS solution. Red colour develops due to the formation of Ferric Thiocyanate. Transfer the solution into 100 C.C. Nessler Cylinder and make up to the mark. This red colour compared with red colour produced by known volume of standard Iron solution.

Iron content (as Fe)

Percent by mass = $(X \times 0.1 \times 100) / (V \times \text{Sp.gr} \times 1000)$

X = Volume in ml of standard Iron solution used

V = Volume of sample taken

1 ml standard Iron solution contains 0.1 mg of Iron.

Sp.Gr: Specific Gravity of sample.

- (4) Determination of free Chlorine :- Take 25 ml of sample into a conical flask.. Dilute with 50 ml distilled water. Titrate with 0.1% Methyl Orange till permanent red colour.

Free chlorine percent by mass = $(V \times 18) / (\text{Sp.Gr.} \times 10000)$..

V = Volume of 0.1% Methyl Orange used for 25 ml of sample.

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- (5) Determination of Residue on ignition :- In a Platinum dish previously ignited at 800 C cooled in a desiccator and weighed. Weigh to the nearest 10 mg approximately 100 grams of the test sample. Evaporate most of the acid (the final volume should amount to about 5 to 10 ml) by carefully heating the dish containing the test portion (on a sand bath) in a fuming cup board. Then allow to cool to room temperature. Add 1 ml of Conc. Sulphuric Acid and heat to dryness. Place the dish containing the residue in an electric furnace at 800 C and keep at this temperature for about 15 minutes. Remove the dish from the furnace, cool in a desiccator and weigh.

Residue on ignition percent by mass = $(M1 \times 100)/M2$

M1 = Mass of residue

M2 = Mass of the sample taken for the test

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