**Estimation of free CO2 from given water sample**

**Aim**: To determine the free CO2 content from given water sample.

**Introduction:**

Free carbon dioxide in the water accumulates due to microbial activity and respiration of microorganisms. Surface water normally contains less than 10mg/L free co2 while some ground water may easily exceed that concentration up to 30-50 mg/L. This imparts acidity to the water because of the formation of carbonic acid. The CO2 content in water may contribute significantly to corrosion.

**Principle:**

CO2 present in water is called free CO2. Free CO2 react with sodium carbonate to form sodium bicarbonate or with sodium hydroxide to form sodium carbonate. Completion of reaction is indicated by the development of pink color characteristics of phenolphthalein indicator at the equivalence pH 8.3.

CO2 + Na2CO3 + H2O ===🡺 2NaHCO3

CO2 + NaOH = Na2CO3 + H2O

**Requirements:**

1. **0.05 N NaOH:-** 40 gm NaOH + 1000 ml DW Heat and then Cool.
2. **Phenolpthalien:-** 50 ml 95% Ethenol + 500 mg Phenolpthalien.

**Experimental Procedure**

* Collect 250-300 ml sample in Nessler tube carefully.
* Take 100 ml sample from collected sample in a conical flask.
* Add few drops of indicator if it shows pink color then no free CO2 present in sample.
* If it remains colorless then titrate it up to pink color appearance.
* Note the reading and repeat the process three times for better results.

**Observation:**

In flask – 100 ml sample

In burette- 0.05 N NaOH

Indicator- Phenolphthalein

End point – Colorless to pink

**Observation table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Burette Level** | **Burette Reading**  | **Mean Burette Reading**  |
| I II III |
| Initial | Initial | 0.5 | 0.4 | 0.3 |  |
| Final | Final | 0.5 | 0.4 | 0.3 | 0.4 |
| Difference | Difference | 0.00 | 0.00 | 0.00 |  |

Calculations:

Chloride mg/L= A x N of NaOH X 1000 x 44/ml of sample

 = 0.4X0.05X1000X44/100

 =8.8 mg/L

**Result:** The concentration of free Co2 in the given water sample is 8.8 mg/L