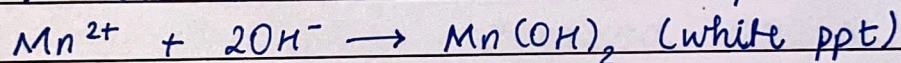


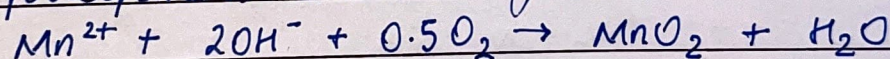
- aim: To determine dissolved oxygen (DO) in waste water.
- Apparatus Required: Conical flask, Burette, testtubes
- Chemical Required: 0.005N $\text{Na}_2\text{S}_2\text{O}_3$ solⁿ, alk. KI solⁿ, MnSO_4 solⁿ, starch solⁿ as indicator.

• Reactions:

If no oxygen is present, a pure precipitate is formed when MnSO_4 and alkali-iodide reagent ($\text{NaOH} + \text{KI}$) are added to the sample

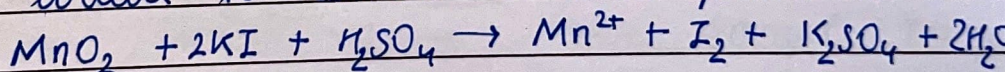


If sample has some oxygen, Mn^{2+} is oxidised to Mn^{4+} & precipitates brown hydrated oxide.

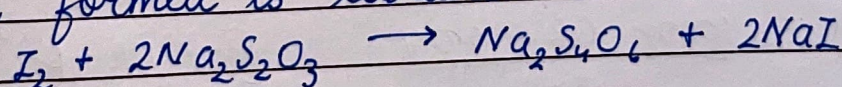


(Brown hydrated ppt)

MnO_2 oxidises iodide to iodine in the presence of acid :



Iodine formed is titrated with thiosulfate solⁿ



Procedure :

1. Take 50 mL of given water sample in a conical flask.
2. Add 2 mL each of alkaline KI solⁿ and MnSO_4 solⁿ
3. Shake the flask vigorously. Brown ppt. will be produced.
4. Now add carefully 2 mL of conc. H_2SO_4 solⁿ and shake.
5. Brownish solⁿ will be liberated, Iodine (I_2) will be produced.
6. Quickly add 2 mL of freshly prepared starch solution (indicator) which gives blue colour.
7. Titrate ~~so~~ slowly against standard 0.005N $\text{Na}_2\text{S}_2\text{O}_3$ solutions till the blue color just disappears.
8. Repeat the titration 4 times.

Results :

1. Volume of 0.005N $\text{Na}_2\text{S}_2\text{O}_3$ solⁿ required for 50 mL of given water sample = 12.0 mL
2. Dissolved oxygen in the given water sample = 9.6 mg/L

Burette : 0.005 N $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ solⁿ

Flask : 50 mL water sample + 2 mL alkaline KI solⁿ +
2 mL of MnSO_4 solⁿ + 2 mL of conc. H_2SO_4

Indicator : 2 mL of starch solⁿ

Color change : Blue to colourless

Observation Table :

Sr no.	Initial Burette Reading (mL)	Final Burette Reading (mL)	Differences (mL)
1	0	12.1	12.1
2	0	12.0	12.0
3	0	12.0	12.0

Calculation :

1000 mL 1N $\text{Na}_2\text{S}_2\text{O}_3$ = 8g of dissolved oxygen

1 mL 1N $\text{Na}_2\text{S}_2\text{O}_3$ = 8mg of dissolved oxygen

1 mL 0.005N $\text{Na}_2\text{S}_2\text{O}_3$ = 0.04mg of dissolved oxygen

x mL 0.005N $\text{Na}_2\text{S}_2\text{O}_3$ = x × 0.04mg of dissolved oxygen

Sample taken :

$$(\text{mg/L}) = \frac{1000 \times \text{BR} \times 0.04}{50}$$

$$\left[\because \text{BR of } \text{Na}_2\text{S}_2\text{O}_3 = \text{I}_2 \text{ liberated} \right]$$