Expt. No. 09

Date 9/04/25

Page No. 22

Aim :- Estimation of Nickel by complexiometric titration.

Theory :-

Nickel is titrated with EDTA against Murexide. At the begining of the titration, solution should have low ammonia concentration increased near the end point. This procedure enhances colour change at the end point. Reaction b/w EDTA and Ni^{2+} ions is relatively slow so titration should be carried out slightly lower than in other direct EDTA determination.

EDTA reacts in the same condition with Cu^{2+} & Co^{+2} as well.
They should be removed or masked before the titration.

Reaction taking part during titration is

$$Ni^{2+} + EDTA^{4-} \longrightarrow Ni[EDTA]^{2-}$$

End point detection : End point of nickel titration is easily detected with murexide. Murexide solution are not soluble and should not be stored longer than a week.

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Solution used : To perform the titration we will need titrant 0.01 M EDTA solution, 10% ammonium chloride and concentrated ammonium solution. We will also need indicators - either in form of solution or ground with NaCl - 100 mg of indicator plus 20g of analytical grade NaCl.

Procedure :-

1. Transfer 10 mL nickel solution to Erlemeyer flask.
2. Add 1mL of 10% ammonium chloride & ammonia to obtained a pH around 8.
3. Add a few drops of murexide indicator into the nickel Sol^n.
4. Titrate slowly with EDTA solution.
5. Continue slow titration till the solution colour changes from yellow to violet.
6. Repeat the same procedure to get two concordent readings.

Result :-

Strength of Nickel used is 0.86 g/lt.

16/4/25

Teacher's Signature

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Calculation :-

N_1 = Normality of $NiSO_4$

V_1 = Volume of $NiSO_4$

N_2 = Normality of EDTA $= \frac{N}{50}$

V_2 = Volume of EDTA

$N_1V_1 = N_2V_2$

($NiSO_4$) (EDTA)

$N_1 \times 10 = \frac{1}{50} \times 10$

$N_1 = \frac{1}{50} \Rightarrow 0.02\,N$

Strength of Nickel used = N_1 x Eq. wt of $NiSO_4$

= 0.02 x 343

= 6.86 g/lt.