

TDC Part III

Practical (Lab Work)



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TOPIC:- PREPARATION OF COORDINATION COMPOUNDS (Sodium tris (oxalato) ferrate (III) complex; $\text{Na}_3[\text{Fe}(\text{C}_2\text{O}_4)_3]$)

PREPARATION OF COORDINATION COMPOUNDS

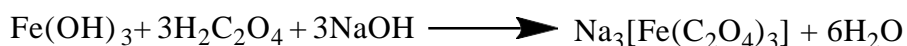
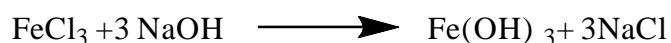
Sodium tris (oxalato) ferrate (III) complex; Na₃[Fe(C₂O₄)₃]

Objective

To prepare sodium tris (oxalato) ferrate (III) complex.

Theory

Mixing of FeCl₃ and KOH in minimum amount of water forms hydrated ferric oxide slurry. And when this slurry is added to the hot solution of sodium oxalate, a greenish-brown solution of Iron (III) oxalate obtained, which on slow evaporation gives greenish crystals of sodium tris (oxalato) ferrate (III).



Requirements

Apparatus: Electronic weighing machine, beaker 500 mL, beaker 250 mL, Bunsen burner, desiccator, filtration apparatus, conical flask, funnel, glass rod, pair of tongs, tripod stand, watch glass, water bath, wire gauze.

Required chemicals: Ferric chloride 2.50 g

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|------------------|--------|
| Sodium hydroxide | 2.75 g |
| Oxalic acid | 3.00 g |

Procedure

I. Preparation of ferric hydroxide: Separately dissolve 2.5 g of FeCl_3 and 1.75 g of sodium hydroxide in 1-2 mL of water. Now add sodium hydroxide solution to ferric chloride solution to make brown colour slurry with stirring. This slurry is the precipitate of $\text{Fe}(\text{OH})_3$. Filter the

precipitate of ferric hydroxide in Bruckner funnel and wash it with small amount of hot water 2 and 3 times.

II. Preparation of sodium tris (oxalato) ferrate (III): Dissolve 3g of oxalic acid in 10-15 mL of hot water then add 1 g of NaOH. Transfer ferric hydroxide in this hot solution with constant stirring. Dissolve $\text{Fe}(\text{OH})_3$ in hot solution, taking 3 moles of oxalic acid per 1 mole of $\text{Fe}(\text{OH})_3$. This will produce dark greenish-brown solution of iron (III) oxalate. Filter the solution and concentrate the green filtrate on water bath and obtain green crystal of sodium tris (oxalato) ferrate (III).

Structure of sodium tris (oxalato) ferrate (III)

2.3.1.5. Result

The yield of sodium tris (oxalato) ferrate (III) is g.