

Effect of electrode combinations on reduction efficiency of Co(II)(CN)₅⁴⁻ in highly KOH medium: A constant current electrolysis study

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A divided electrochemical cell has already been made in environmental pollutants removal process using anodic part of a full electrochemical cell. Now, the utilization of full electrochemical cell in the form of MEO and MER process is of great interest among researchers. It is evident from the literature that electrode pairs make overall cell potential shift. In this regard, the present investigation focuses on reduction efficiency of Co(II)(CN)₅⁴⁻ especially at different combinations of electrodes. At first step, current density, temperature, and anodic part (Pt electrode as anode in 5 M H₂SO₄) kept constant. The Co(II)(CN)₅⁴⁻ reduction investigated using different cathodes like Ag, Cu, Zn and Carbon in 10 M KOH solution. The reduction of Co(II)(CN)₅⁴⁻ confirmed via ORP electrode by reduction potential variation. The oxidation/reduction efficiencies calculated using titration with FeSO₄ and KMnO₄. Additionally, cyclic voltammetry, and surface analysis, like SEM and XRD, of electrode paved to support the electrode combination on effective reduction of Co(II)(CN)₅⁴⁻. Finally, there will be a discussion on the pair of electrodes combination on an effective reduction of Co(II)(CN)₅⁴⁻ as a mediator.