

Concentration effect of Ni(II)(CN)_5^{4-} reduction on Ti, Ag, Cu electrodes in highly alkaline medium: An electrolysis study

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MEO is emerging field towards environmental pollutants removal process using anodic part of a full electrochemical cell. At the same time, Mediated electrochemical reduction (MER) is in initial level, which must be enrooted to utilize the full electrochemical cell. It is evident from the literature that metal complexes are more suitable to use as a mediator in the MER process due to stabilize the active low valent state of metal ion. The present investigation focuses on reduction of Ni(II)(CN)_5^{4-} - especially at different electrodes and concentrations. At first step, current density, temperature, and anodic part (Pt electrode as anode in 5 M H_2SO_4) kept constant. The Ni(II)(CN)_5^{4-} - reduction investigated using its different concentration and cathodes like Ti, Ag and Cu in 10 M KOH solution. The reduction of Ni(II)(CN)_5^{4-} - confirmed via ORP electrode by reduction potential variation. The reduction efficiencies calculated using titration with FeSO_4 and KMnO_4 . Additionally, cyclic voltammetry, SEM and XRD analyses of the electrodes paved a way to support the suitable electrode on effective reduction of Ni(II)(CN)_5^{4-} - . Finally, there will be a discussion on the electrode and concentration dependence of Ni(II)(CN)_5^{4-} - reduction.