

Electrolytic generation of homogeneous Co(I)(CN)_5^{4-} and Ni(I)(CN)_5^{4-} in highly alkaline medium for MER of TCE reduction: A 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, MER is in initial level, which must be developed to utilize the full electrochemical cell. It is evident from the literature that combination of anode and cathode decides the overall cell voltage. The present investigation focuses on reduction of TCE (trichloro ethylene) using electro-reduced Co(I)(CN)_5^{4-} and Ni(I)(CN)_5^{4-} . At first, current density, temperature, and the anodic/cathode part has fixed by keeping Pt and Ag as anode and cathode, respectively, in 0.01 M Co(II)(CN)_5^{3-} and Ni(II)(CN)_5^{3-} in 10 M KOH constant. The reduction of Co(II)(CN)_5^{3-} and Ni(II)(CN)_5^{3-} confirmed via ORP electrode. The reduction efficiencies were calculated using titration with FeSO_4 and KMnO_4 . Additionally, CV results supports the mediated reduction of TCE via Co(I)(CN)_5^{4-} and Ni(I)(CN)_5^{4-} . The GC analysis showed product that formed in the reduction process. Finally, there will be a discussion on the TCE reduction mechanism using electro-generated Co(I)(CN)_5^{4-} and Ni(I)(CN)_5^{4-} .