

Gaseous CCl_4 removal using electrochemically generated homogeneous Ni(I)(CN)_4^{3-} by
electro-scrubbing

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Gas pollutants must be removed to have healthy environmental air for humans. Among many ways to remove them, metal ions mediated electrochemical reduction (MER) is a futuristic technology. 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)_4^{2-} especially at the Cu electrode in KOH medium. At a first step, Pt electrode as anode in 5 M H_2SO_4 in anodic part kept constant. Electrolytic reduction of Ni(II)(CN)_4^{2-} identified by ORP variation and potentiometric titration. Suitability of cathodes from Ag, Ti, carbon, and Cu in 10 M KOH solution were tested. The reduction efficiencies changes calculated using titration with KMnO_4 . Cyclic voltammetry analysis at said electrodes correlated with the reduction of Ni(II)(CN)_4^{2-} . A model gas pollutant CCl_4 removal carried out by electro-scrubbing with online FTIR gas analyzer.