

Gaseous  $\text{CF}_4$  removal using electrochemically generated homogeneous  $\text{Cu}[\text{Ni}(\text{CN})_4]^{3-}$  by electro-scrubbingA.G.Ramu, G. Muthuraman, 문일식<sup>†</sup>

순천대학교

(ismoon@sunchon.ac.kr<sup>†</sup>)

Growing semiconducting industries leaves similar amount of  $\text{CF}_4$  to the environment that are dangerous to the healthy environment and humans. Among few ways to remove  $\text{CF}_4$ , electrochemical way of its removal become simple and 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 removal of gaseous  $\text{CF}_4$  using electrogenerated  $\text{Cu(I)[Ni(II)(CN)}_4]^{2-}$  in KOH medium. At a first step, electrochemical reduction of  $\text{Cu(II)[Ni(CN)}_4]^{2-}$  was optimized at different electrodes like  $\text{TiO}_2$ , Ag, carbon. Electrolytic reduction of  $\text{Ni(II)(CN)}_4^{2-}$  identified by ORP variation and potentiometric titration. The reduction efficiencies changes calculated using titration with  $\text{KMnO}_4$ . Cyclic voltammetry analysis at said electrodes correlated with the reduction of  $\text{Ni(II)(CN)}_4^{2-}$ . Finally,  $\text{CF}_4$  removal was carried out under optimized conditions using electro-scrubbing with online FTIR gas analyzer and removal efficiency found 99%.