

Consistent electrochemical generation of homogeneous Ni(I) electron mediator facilitates continuous removal of SF₆ at ambient temperature

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SF₆ removal beyond plasma method is homogeneous catalyst by batch method at little elevated temperature. Here in, we report first time continuous removal of SF₆ at ambient temperature by homogeneous reductive electron mediator. at electro-scrubbing process. First, [Ni(I)(CN)₄]³⁻ was generated by electrochemical way using paired electrolysis at cathodic half-cell in 10 M KOH solution, which facile continuous electron mediator generation. The concentration of electrogenerated Ni(I) was derived from potentiometric titration and different applied current density used to establish the suitable condition. The electrogenerated Ni(I) pumped on the scrubber column continuously to remove the SF₆ which was entered under the wet scrubbing column. The removal of SF₆ was monitored by online FTIR gas analyzer which was attached to the column exit. The feed concentration and gas flow rate effect were analyzed on SF₆ removal and discussed.

Key words: MER, SF₆ removal, electro-scrubbing, Greenhouse gas removal