CO_2 removal using electrogenerated homogeneous [Co1+(CN)5]4- reductive electron mediator at single step electroscrubbing

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CO2 reduction on electrodes induces passivation and not applied to real site yet. A single stage CO2 removal process can be an energy minimizing method that is the present goal. The electron mediator [Co1+(CN)5]4- was generated in 10 M KOH at cathodic half-cell and confirmed by oxidation/reduction potential (ORP) change and quantified by potentiometric titration method. The electrogenerated homogeneous [Co1+(CN)5]4- was pumped to top of a scrubber column to react with CO2 gas with counter current reaction method. The exit gas from the scrubber column was monitored by inline FTIR gas analyzer and GC. Finally, based on the product analysis by inline FTIR and GC, a possible reaction pathway and energy have been compared with exited methods.

Key words: CO2 removal, electroscrubbing, MER, electron mediator.