Room temperature removal of CO_2 to useful products at single step electroscrubbing

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Catalyst with high temperature and three stage wet-column absorption were practiced for removal of CO_2. This work aims to develop a single stage CO_2 removal process at room temperature. The electron mediator $[Co^{1+}(CN)_5]^{4-}$ 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 $[Co^{1+}(CN)_5]^{4-}$ was pumped to top of a scrubber column to react with CO_2 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 was proposed.

Key words: CO_2 removal, electroscrubbing, MER, electron mediator.