

Pt cathode facilitates direct reduction of NO along with mediated reduction at electro-scrubbing process

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Inspired by direct reduction of NO by polycrystalline and Pt (111) phase cathodes to N₂O and NH₃ formation, use of Pt cathode could be beneficial for enhanced reduction of NO with combination of mediated electrochemical reduction (MER) and direct electrochemical reduction (DER) processes instead of only MER. This work presents, a lab scale 50 and 400 cm² working electrode area contained divided electrochemical cell was developed and used to generate [Ni(CN)₄]³⁻ in 10 M KOH using polycrystalline Pt cathode with capacity of 0.6 to 2 L scrubbing solution (catholyte). The electrogenerated [Ni(CN)₄]³⁻ was concurrently scrubbed the feed gas NO at electroscrubbing. This NO reduction process was characterized and monitored by real time FTIR gas analyser.

Keywords: NO reduction, NH₃ formation, MER, DER, Electro-scrubbing