

Macro flow sensor for electrochemically generated electron mediator $[\text{Co(I)(CN)}_5]^{4-}$ in 10 M KOH: Redox potential and current optimization through electrodes

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Electrochemical sensors at high concentrated electrolyte is still in infant stage. The present work aims to develop a suitable electrode to monitor electrogenerated $[\text{Co(I)(CN)}_5]^{4-}$ in 10 M KOH solution using a in-situ flow sensor cell. First, suitable potential window for each electrode was derived using cyclic voltammetry under flow condition (solution flow rate between 0.5 to 3.0 L/min). Then suitable scan rate under the flow condition was identified using the selected electrode. The current at limiting current region or optimum peak region was selected for electrogenerated $[\text{Co(I)(CN)}_5]^{4-}$ in 10 M KOH solution at suitable electrode. The electrochemically generated $[\text{Co(I)(CN)}_5]^{4-}$ by using potentiometric titration at different electrolysis time was used to make calibration plot that was used to correlate with current value measure using suitable electrode at different electrolysis time. The optimized calibration plot will be used to identify the electrochemically generated $[\text{Co(II)(CN)}_5]^{4-}$ concentration by in-situ way.

Key words: Macro sensor, In-situ flow cell, high concentrated supporting electrolyte, mediator monitoring.