

Metal ion mediator crossover elimination by MFI-type zeolite coated ceramic tubular membrane for effective generation of two electron mediators

이보열, G. Muthuraman, A.G. Ramu, 문일식†
순천대학교
(ismoon@sunchon.ac.kr†)

Elimination of metal ion crossover via membrane is a big challenging part in many field. The present work attempt to eliminate two homogeneous mediators Co(III) and $[\text{Ni(I)(CN)}_4]^{3-}$ crossover by a tubular MFI-type zeolite coated ceramic membrane in a divided electrochemical cell. The electro-generation of Co(III) and $[\text{Ni(I)(CN)}_4]^{3-}$ were achieved by paired electrolysis and confirmed by ORP change. No metal ion crossover via MFI-zeolite coated cerami membrane confirmed by UV-visible spectral analysis. The achieved Co(III) and $[\text{Ni(I)(CN)}_4]^{3-}$ concentrations by the MFI-type membrane containing tubular cell was 57% and 15%, which are equal to the commonly used Nafion324 membrane in planar arrangement. The pH change could be the reason for no migration of Co(II) or $[\text{Ni(II)(CN)}_4]^{2-}$.

Key words: MFI-zeolite tubular membrane, tubular electrochemical cell, two mediator generation, no-crossover