Evolution of tubular divided cell by MFI-type zeolite coated ceramic tubular membrane for concurrent generation of two electron mediators

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Our recent work of tubular electrochemical reactor proved a single electron mediator can be generated. The present work explains two homogeneous mediators Co(III) and [Ni(I)(CN)4]3- have been generated using a tubular MFI-type zeolite coated ceramic membrane divided electrochemical cell via paired electrolysis. The electro-generation of Co(III) and [Ni(I)(CN)4]3- were achieved in highly acid and highly base pHs respectively. The achieved Co(III) and [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. At the same time no migration of Co(II) or [Ni(II)(CN)4]2- were observed and additional results will be discussed finally.

Key words: Zeolite tubular membrane, tubular electrochemical cell, two mediator generation, paired electrolysis