

A consequence of polymer modified electrodes towards generation of low valent ligand free electron mediator Co(I) by paired electrolysis for air pollutant removal

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In ligand free reductive electron mediators generation, its stabilization in solution was achieved by adjusting the electrolyte concentration but, deposited as metal on the electrode surface restrict its application in air pollutant removal process. Through the present investigation, some polymeric modified electrodes were attempted towards generation of Co(I). Here, polyaniline, PEDOT (polyethylenedioxythiophene), and polypyrrole electrodes were electrochemically prepared and used as cathode in a divided electrolytic cell to generate Co(I). Each polymerized electrodes were confirmed by the cyclic voltammetry and SEM-EDS analyses. Efficiency of the prepared polymeric electrodes were tested on Co(II)(OH)₄ reduction in 10 M KOH solution at cathodic half-cell. Finally, a comparative analysis was made to identify the suitable electrode.

Key words: Polymeric electrodes, Reductive electron mediator, Electro polymerization, Ligand free mediator.