SELECTIVE SEPARATION OF 
LEAD (II) AND CADMIUM (II) FROM SIMULATED 
WASTEWATER SOLUTIONS BY ELECTRODEPOSITION ON 
CARBON BASED ELECTRODES 

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Abstract

The efficiency of electrodepositing Pb and Cd onto two carbon based electrodes - glassy carbon electrode (GCE) and activated carbon paste electrode (CPE) and the selectivity of separating these metals from mixtures were investigated by cyclic voltammetry and square wave voltammetry. Good efficiency was observed in depositing Pb onto these electrodes but for Cd deposition, the efficiency was limited by the hydrogen evolution reaction at pH 3 and the dissociation of water at pH 5. However, this efficiency was improved when some amount of Pb was preplated onto the electrodes. When excess malonic acid was present in the system, the deposition of Cd from its single cation system was improved due to the buffering action of malonic acid and the formation of an activated intermediate that accelerated the electron transfer. Good selectivity was observed for Pb(II) and Cd(II) in system with or without the presence of malonic acid when these two electrodes were employed.
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