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Photo-electrodialysis combination system for Pb^{2+} removal using polymeric membrane/semiconductor

The present work combines the solar energy with the environmental protection through the membrane selectivity for metallic ions. Firstly, we have elaborated new polymeric membranes for ions separation. The membrane is polymerized from cellulose triacetate modified by poly-ethyleneimine and plasticized by 2-nitrophenyl pentyl ether. Different membranes are characterized by Fourier Transform Infra-Red (FTIR), X-Ray Diffraction (XRD), Thermo-Gravimetric Analysis (TGA) and Scanning Electron Microscopy (SEM). In a second part, we have prepared two new photo-electrodes, crystallizing in the brownmillerite structure: $n-Sr_2Fe_2O_5$ and $p-CuCrO_2$ and their photo-electrochemical characterizations are undertaken. The photo-electrodialysis indicates that the combined system $p-CuCrO_2$ /membrane/ $n-Sr_2Fe_2O_5$ enhances considerably the electrons transfer and the diffusion flux of Pb^{2+} . The diffusion flux of cadmium increases considerably when the electrode is exposed to visible light. The results show that the transport percentages of Cd^{2+} increases by 86% under solar energy and 35% using a tungsten lamp.

Preferred topic

Other

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