Electrocatalysis

The Effect of g-C3N4 Materials on Pb(II) and Cd(II) Detection Using Disposable Screen-Printed Sensors

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Abstract
The disposable electrochemical sensors were designed and fabricated onto a photo paper substrate in-house.We report a first case use of g-C3N4, which is an emerging material as the most stable carbon-like polymer, explored for application as the electrochemical sensor on heavy metal ion detection. In this work, Bi/g-C3N4 materials were coated on the sensors using the dropcoating method. Pb(II) and Cd(II) were used as representative ions for this study. On the Bi/g-C3N4 (50:50 wt%)-coated sensor, the limit of detection (LOD) values of Cd (II) in buffer solution were 17.5 ìg L.1 and 8.1 ìg L.1 for Pb(II). For Bi nanoparticle– coated sensor, the LOD values of Cd(II) and Pb(II) in buffer solution were 21.8 and 10.4 ìg L.1, respectively. From the water sample analysis, the Bi/g-C3N4-coated sensor illustrated slightly better responses for Cd(II) and Pb(II) in spiked tap water without pH adjustment compared to spiked tap water with pH adjustment. The results suggested that Bi/g-C3N4 is a functional detection material for Cd(II) and Pb(II) in water without pre-processes required.