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**A novel voltammetric sensor for the simultaneous detection of Cd²⁺ and Pb²⁺
using graphene oxide/ κ -carrageenan/L-cysteine nanocomposite**

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Highlights

- The electrode exhibits remarkable analytical performance for Cd²⁺ and Pb²⁺ in SWASV.
- The modified electrode exhibits good selectivity, stability and reproducibility.
- GO/ κ -Car/L-cys/GC has the ability to detect multiple metal ions.
- The GO/ κ -Car/L-cys modified electrode is suitable for real sample analysis.

Abstract

Simultaneous determination of Cd²⁺ and Pb²⁺ was achieved by using graphene oxide/ κ -carrageenan/L-cysteine (GO/ κ -Car/L-cys) nanocomposite modified glassy carbon electrode (GCE) by Square Wave Anodic Stripping Voltammetry (SWASV). The morphology and functionalization of the prepared nanocomposite were characterized by XRD analysis, Raman spectroscopy, Field emission scanning electron microscopy and FTIR analysis. Under optimum conditions, outstanding linearity was obtained for both Cd²⁺ and Pb²⁺ in the range from 5-50 nM with the detection limits as 0.58 nM and 1.08 nM respectively. The sensitivity calculated from the slope of calibration curve was 1.39 μ A/nM and 1.32 μ A/nM for Cd²⁺ and Pb²⁺ respectively. We also carried out multiple metal ion

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