Simple Fabrication of Reduced Graphene Oxide – Ionic Liquid Composite Modified Electrode for Sensitive Detection of Sulfadiazine

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A convenient amperometric sensor based on incorporation of the reduced graphene oxide (rGO) and N-octyl-pyridinium-hexafluorophosphate (OPPF₆) ionic liquid (IL) as the selective receptor was described. The synergistic cooperation of the rGO and OPPF₆ contributed to a perfect performance of the electrochemical sensor. Compared with a bare glassy carbon electrode (GCE), the composite of rGO-OPPF₆ greatly improved the performance for the detection of sulfadiazine (SD) including a low anodic potential, sensitive current response, and good selectivity. The trace residues of the SD could be linearly assessed in the concentration range of 0.22-63.00 µmol/L (µM) with a detection limit of 0.07 µM. Additionally, the prepared sensor was successfully applied for the detection of the SD in an animal feed with recovery higher than 90%. The results agreed well with those obtained by high-performance liquid chromatography.

Keywords: sulfadiazine, graphene, ionic liquid, food safety, sensor

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