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# Facile synthesis of layered CuS/RGO/CuS nanocomposite on Cu foam for ultrasensitive nonenzymatic detection of glucose

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**Abstract:** A novel ultrasensitive nonenzymatic sensor was prepared by in-situ growing layered CuS/RGO/CuS (Reduced graphene oxide, RGO) nanostructure on the Cu foam surface through a hydrotherm-assisted process. The CuS/RGO/CuS nanocomposite was characterized with X-ray diffraction (XRD), Raman spectroscopy, X-ray photoelectron spectrometer (XPS) and field emission scanning electron microscopy (FESEM). This CuS/RGO/CuS/Cu was directly used as electrochemical sensor of glucose, and its performance was evaluated by cyclic voltammetry and amperometry techniques. The nonenzymatic biosensor exhibited ultrahigh linear sensitivities of 22.67 and 10.54 mA mM<sup>-1</sup> cm<sup>-2</sup> in the concentration ranges of 1-655 μM and 0.655-1.055 mM, respectively. The detection limit was determined to be 0.5 μM with the signal-to-noise of three. Furthermore the sensor showed good long-term stability and good performance in human blood analysis. The present work gives a new insight into facile preparation of metal sulfides/RGO/metal sulfides nanocomposite on its metal substrate and its potential application in nonenzymatic glucose sensor.

**Keywords:** CuS/RGO/CuS; Nonenzymatic sensor; Glucose; Graphene oxide (GO); Reduced graphene oxide (RGO); Cu foam

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