

A highly sensitive non-enzymatic electrochemical glucose sensor based on g-C₃N₄/NiO composite nanostructure

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The development of highly sensitive glucose sensor has attracted considerable attention in human's health protection project. In this research, the facile thermal polymerization of melamine to graphitic carbon nitride (g-C₃N₄) in the presence of nickel oxide (NiO) were studied for synthesized NiO/g-C₃N₄ composite as sensing material. In order to evaluate the effect conditions on the fabrication of composite, the different temperature and ratio between NiO and g-C₃N₄ were employed as preparation variables to optimize the sensing glucose performance. The composite as prepared at T = 370 °C with the ratio NiO:g-C₃N₄ is 1:1 showed the highest sensitivity and selectivity towards glucose, due to the optimal morphology between NiO and g-C₃N₄ to enhance electron transfer ability. Moreover, no significant response with anti-interference was observed and it exhibits a low detection limit is 5.73 microM. As a result, the NiO/g-C₃N₄ nanocomposite is a promising contender material for novel non-enzymatic electrochemical glucose sensor applications.

Keywords — Graphitic carbon nitride, nickel oxide, glucose sensor, non-enzyme