

Glucose sensor based on functionalized fluorescent graphitic carbon nitride (g-C₃N₄) quantum dots with phenylboronic acid

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The graphitic carbon nitride quantum dots (g-CNQDs) were prepared by a simple hydrothermal process and applied for the detection of glucose. Fourier infrared spectroscopy (FT-IR), X-ray photoelectron spectroscopy (XPS) and X-ray diffraction (XRD) and Transmission electron microscopy were used to characterized of g-CNQDs. The sensitivity of glucose was investigated based on phenylboronic acid (PBA) as-functionalized on g-CNQDs. The fluorescence intensity of g-CNQDs/PBA increases with the increase in the concentration of glucose. The results show that it has a high selectivity to glucose and exhibits two linear in the range of 25 nM – 1 μM and 1 μM – 1 mM with a detection limit is 10 nM. Moreover, it has been successfully used for sensing glucose in the real sample and the response from interfering reagents are very small when compared to the response of glucose. Therefore, the g-C₃N₄ represent a promising candidate as fluorescent glucose sensor and closer toward a clinical diagnostics and biomedical applications.