

Optical tunable L-Cysteine-functionalized Graphene quantum dots as fluorescent probes for highly selective and sensitive detection of Mercury ions

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In our work, graphene quantum dots (GQDs) which are functionalized with L-cysteine (cysteine-GQDs) are less than 6 nm in diameter and 1-3 layers thick were successfully synthesized via hydrothermal process from citric acid and L-cysteine. The functionalized GQDs shows a strongly green photoluminescence (PL) with quantum yield as high as 27.71%. Furthermore, these GQDs exhibit a large change of PL intensity in presence of mercuric (II) ions over other cations such as Fe^{3+} , Na^+ , and Cu^{2+} , thus making cysteine-GQDs useful for highly sensitive and selective fluorescence probes for Hg^{2+} ions in aqueous media. More importantly, the detection limit of 1 μM .