Title:	Graphitic carbon nitride QDs impregnated biocompatible agarose cartridge for removal of heavy metals from contaminated water samples
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Keywords:	Graphitic carbon nitrides Quantum dots Density functional theory Mercury detection
Issue Date:	2019
Publisher:	Elsevier
Citation:	Journal of Hazardous Materials, 367,pp. 629-638.
Abstract:	Highly fluorescent, water-stable graphitic carbon nitride quantum dots (gCN QDs) synthesized by microwave assisted solvo-thermal technique and characterized via optical spectroscopy, XRD, HR-TEM, Fluorescence spectroscopy, FT-IR and Raman spectroscopy. Synthesized gCN were used for the removal of mercury ions from polluted water samples in a microcartridge format. Density functional theory (DFT) calculations revealed a possible interaction of mercury atoms, and embedment of mercury atom onto synthesized gCN surface lead to moderate structural distortion, reduced band gap and altered dielectric response. Experimentally, the excitation dependent fluorescence of QDs is highly compromised in presence of mercuric (Hg2+) and other ions, validating the theoretical findings, and establishing their use as metal sensor probes. Hg2+ binding ability with gCN QDs was further utilized in developing bioinspired micro-cartridge via covalent conjugation to Agarose microbeads. Micro-cartridge can remove heavy metal contamination from polluted water with a binding efficiency of 24.63 mg HgCl2 for 10 mg of Agarose-gCN conjugate.
Description:	Only IISERM authors are available in the record.
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