Supporting Information

**Synthesis and characterization of multifunctional CdTe/Fe$_2$O$_3$@SiO$_2$ core/shell nanosensors for Hg$^{2+}$ ions detection**

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**Figure. S1** PL spectra of CdTe QDs (606 nm) and CdTe/Fe$_2$O$_3$@SiO$_2$ core/shell nanostructures (612 nm) under excitation of 370 nm.
**Figure. S2** XPS fully scanned spectra (a), XPS spectra of Hg4d (b) and Hg 4f (c) from CdTe/Fe₂O₃@SiO₂ nanocomposites exposed to Hg²⁺ ions.
Figure. S3 Fluorescence response of CdTe/Fe$_2$O$_3$@SiO$_2$ core/shell nanosensor in buffered (NaAc-HAc, pH = 7) solution upon different concentrations of metal cations (a 1 mM, b 0.1 mM, c 0.01 mM) with an excitation at 370 nm.