

A cytocompatible carbon dot based fluorescent probe for nitrite ion sensing

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An intriguingly fluorescent and pH responsive carbon dot has been synthesized. Different water-soluble anions are found to modify the emission of as-synthesized carbon dots. Among them nitrite is found to quench the fluorescence of the carbon dots with the increase in concentration. The concentration dependent quenching paves the way of selective nitrite sensing. The linear detection range is 2.3×10^{-6} M to 7.7×10^{-4} M and the limit of detection is 7.9×10^{-9} M. This method has been successfully applied to the determination of nitrites in tap and river water and the recovery is 95%–99%. The fluorescence mechanism of the nitrite ion-carbon dots system has investigated through spectrochemical analyses. The quenching has been explained taking in to account of the hindrance in radiative recombination and electron-hole injection phenomenon.

Keywords

Carbon dot; nitrite ion; sensing; quenching; cytocompatible.