

Turn-off/on fluorescent probe for the detection of Fe(III) ions and ascorbic acid in one pot

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In this work, we synthesize intriguingly fluorescent nitrogen and boron rich carbon dots (NCDs) through a green and facile process. With the help of proper spectrochemical characterization the size and morphology has been explained. The NCDs emission has been examined in presence of different metal ions. The fluorescence is quenched selectively in the presence of Fe(III) ion with the increase in Fe(III) concentration in the reaction medium. From this fluorescence “Turn Off” phenomenon, we can detect Fe(III) in aqueous solution and the limit of detection (LOD) is 18.2 microM. This quenched fluorescence is found to be recovered in the presence of ascorbic acid (AA) selectively. This “Turn On” phenomenon is AA concentration dependent and allows to detect AA in aqueous solution with LOD value of 77.6 microM. The real sample analysis with tap and river water has been done for the detecting Fe(III) and AA ions with as-prescribed method.

Keywords: Carbon dots, Fe(III) ions, ascorbic acid, turn-off/on fluorescence