L-CYSTEINE ZnS:Mn QUANTUM DOTS FOR DOPAMINE DETECTION WITH HIGH SENSITIVITY

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L-cysteine capped Mn doped ZnS quantum dots (L-cys-ZnS:Mn QDs) is prepared via a wet chemical approach. The QDs display a prominent orange emission band peaking at $\sim$598 nm, when exposed to 325-nm light. Since their room-temperature phosphorescence is efficiently quenched by dopamine (DA), they have been employed as phosphorescence probe for detecting DA. The linear working range and limit of detection of L-cys-ZnS:Mn QDs are $\sim$2.5–37.5 and $\sim$0.72, respectively. The possible quenching mechanism has been discussed in detail. The QDs probe is highly selective to DA over other common ions, amino acids, glucose and bovine serum album. Finally, they have been successfully applied for detection of DA in human urine samples with recoveries as high as 98–104%. Our work provides a simple and convenient phosphorescence method to determine DA in real samples.

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