

Uncovering the actual inner-filter effect between highly efficient carbon dots and nitroaromatics

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High performance sensors can be produced by adequately designing the chemical structure and uncovering the actual detection mechanism. In this study, a fluorescent probe was synthesized for various nitroaromatic molecules, including stereochemically varied nitrophenols and nitroaniline. A systematic investigation of the influence of various analytes on the luminescence behavior of the as-synthesized carbon dot (CDs) revealed the inner-filter effect to be the major detection mechanism. The extinction coefficient and spectral overlap were found to be the critical parameters for high sensitivity and good selectivity rather than the functional groups of the CDs and analytes.