

Electronic Supplementary Information

Carbon Dots Tailored with Fluorophore for Sensitive and Selective Detection of Hydrogen Sulfide based on Ratiometric Fluorescence Signal

Guoqiang Liu,^a Hongwei Ge,^a Ranhao Yin,^a Long Yu,^a Congming Sun,^a Weiru Dong,^a Zhenli Sun,^a Khalid A. Alamry,^b Hadi M. Marwani,^b and Suhua Wang^{a, b, *}

^aMOE Key Laboratory of Resources and Environmental Systems Optimization, College of Environmental Science and Engineering, North China Electric Power University, Beijing 102206, China.

^bChemistry Department, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia.

* To whom correspondence should be addressed:

E-mail: wangsuhua@ncepu.edu.cn (S. H. Wang)

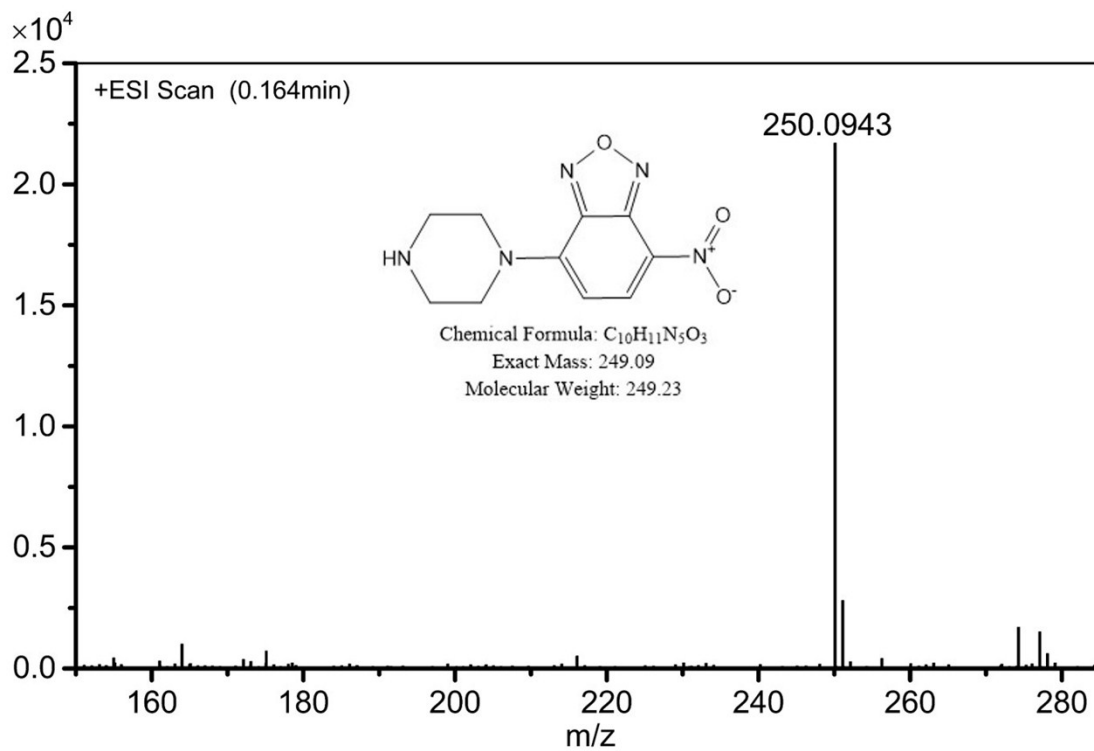


Fig. S1 HRMS spectrum of P-NBD.

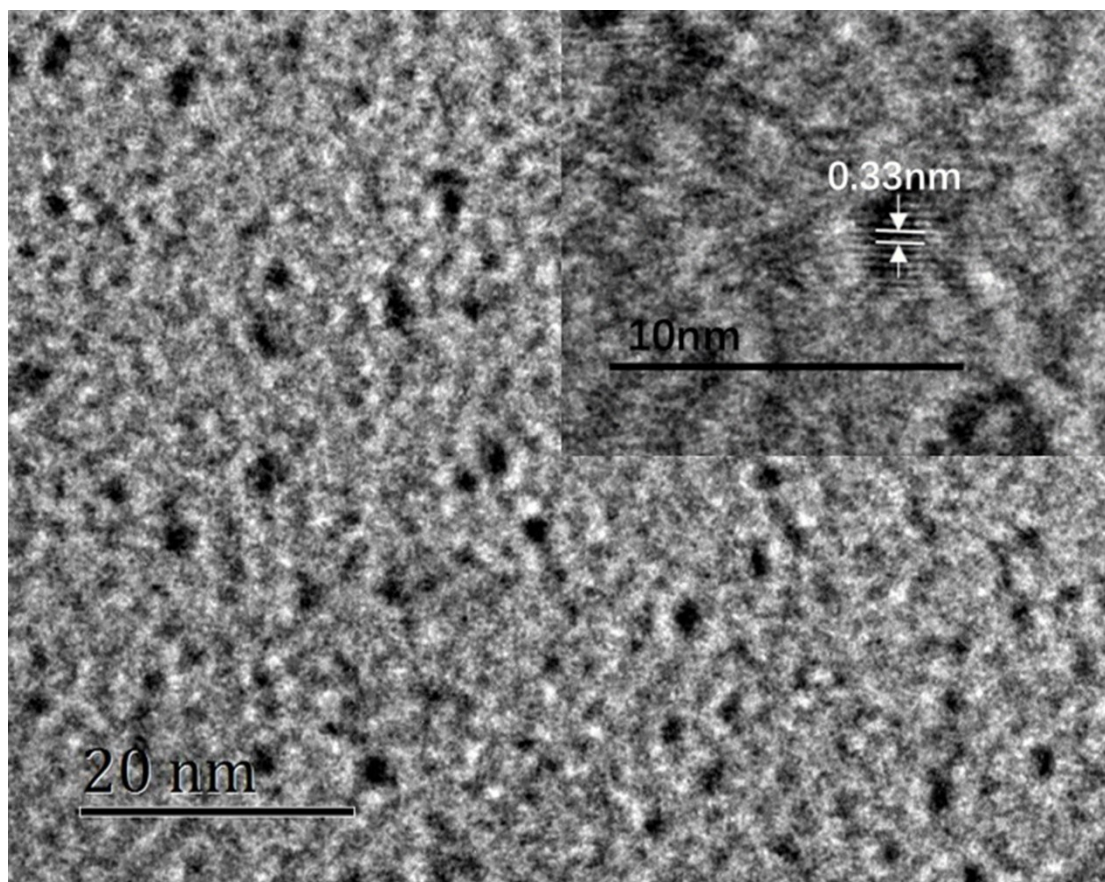


Fig. S2 TEM image of as-prepared CDs. Inset: the HRTEM image of the CDs.

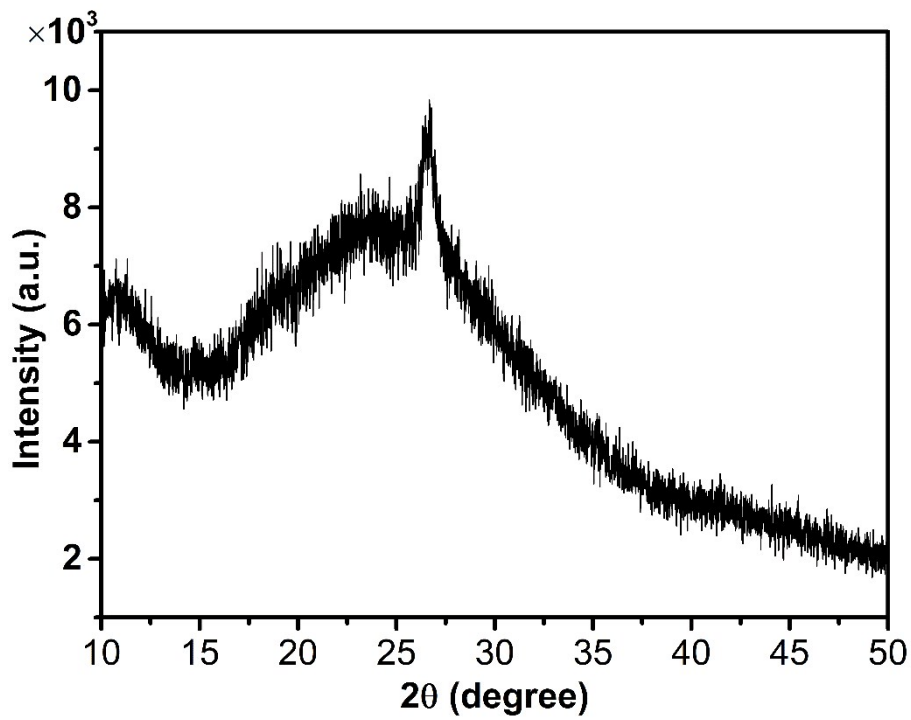


Fig. S3 XRD pattern of the as-synthesized CDs.

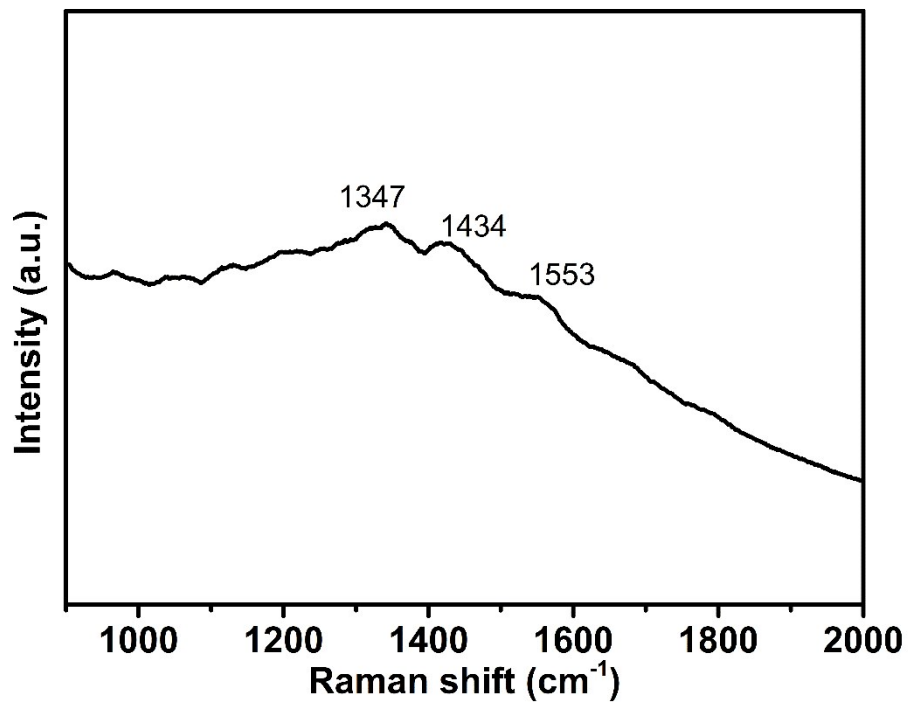


Fig. S4 Raman spectra of the as-synthesized CDs.

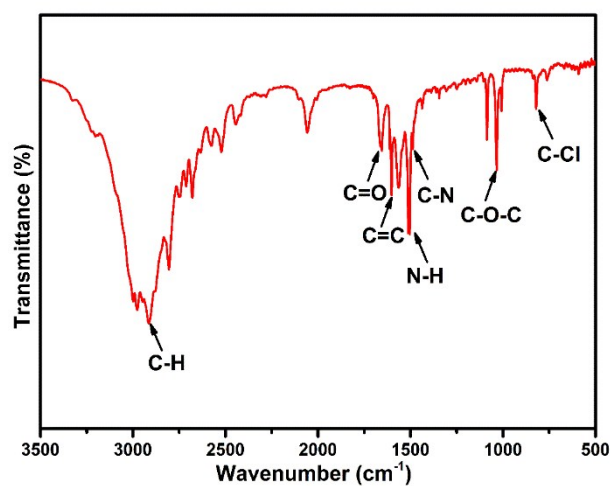


Fig. S5 FTIR spectrum of the as-synthesized CDs.

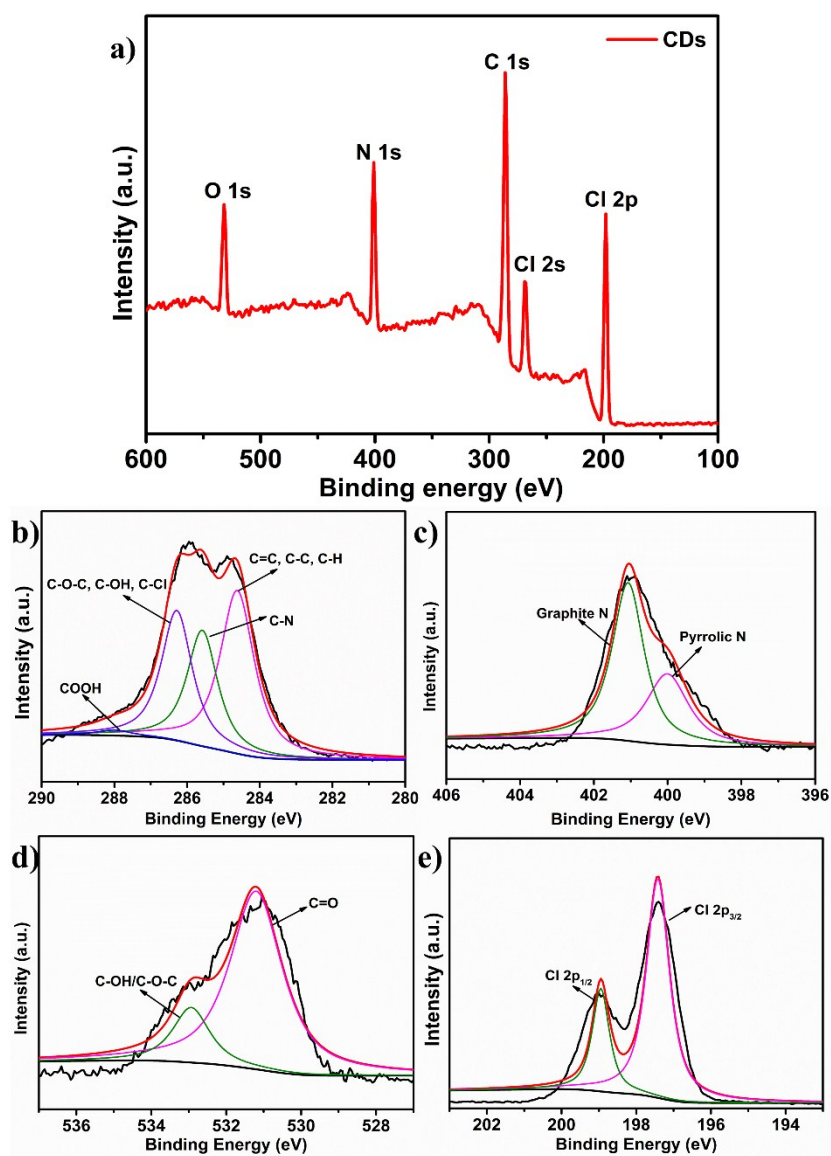


Fig. S6 XPS full survey (a), high-resolution XPS of C 1s (b), N 1s (c), O 1s (d) and Cl

2p spectra of CDs (e).

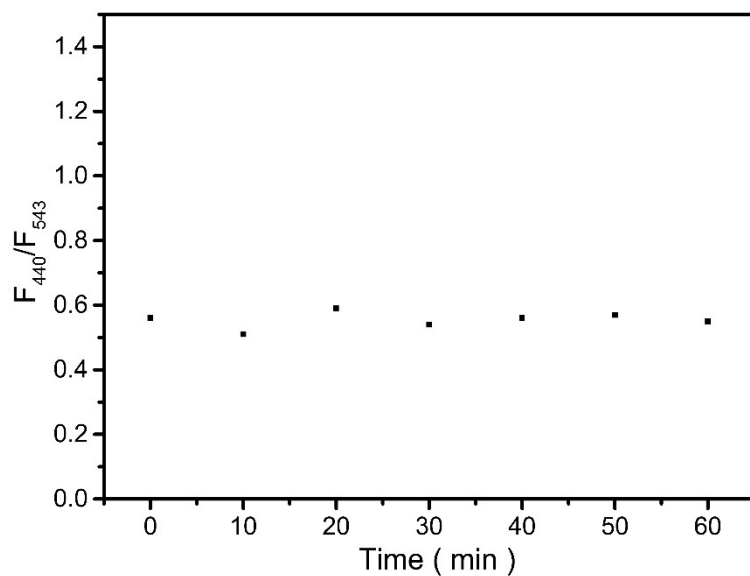


Fig. S7 Stability of the fluorescence intensity ratio of the ratiometric probe.

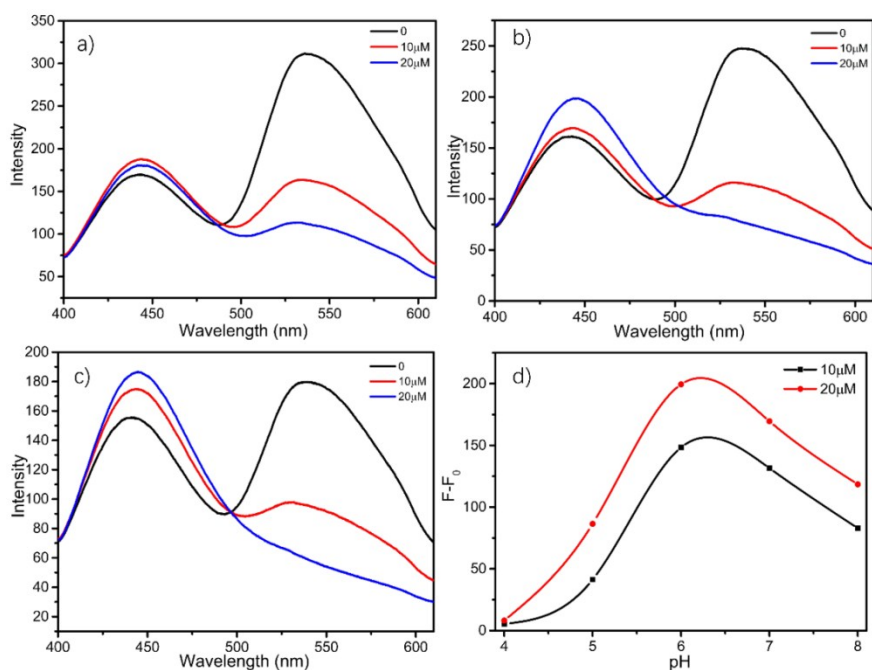


Fig. S8 Detection of hydrogen sulfide by probe under different pH conditions. a), b), c) is the response of the probe to different concentrations of H₂S at pH=6, 7, 8. d) Response curve of probe to hydrogen sulfide at pH 4-8. F, F₀ is the fluorescence intensity of probe in the absence and presence of H₂S, respectively

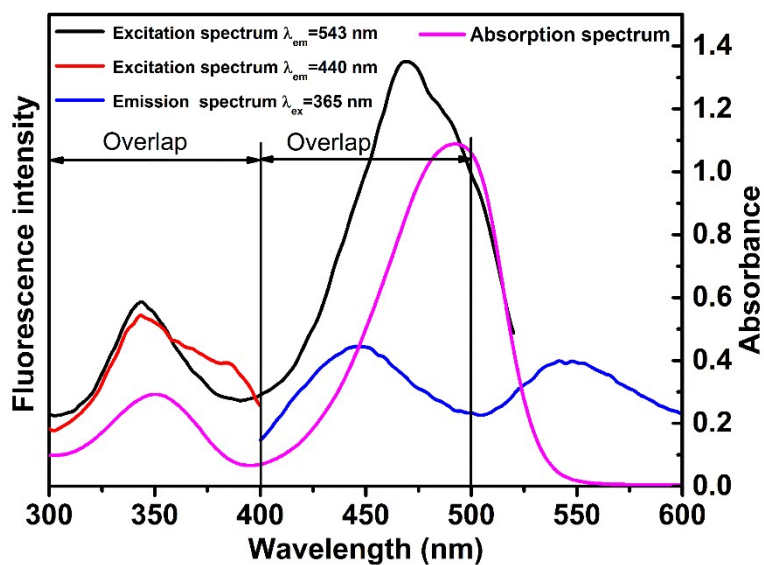


Fig. S9 The fluorescence emission and excitation spectra of the CDs-PNBD and the absorption spectrum (pink) of the NBD-based derivatives, respectively.

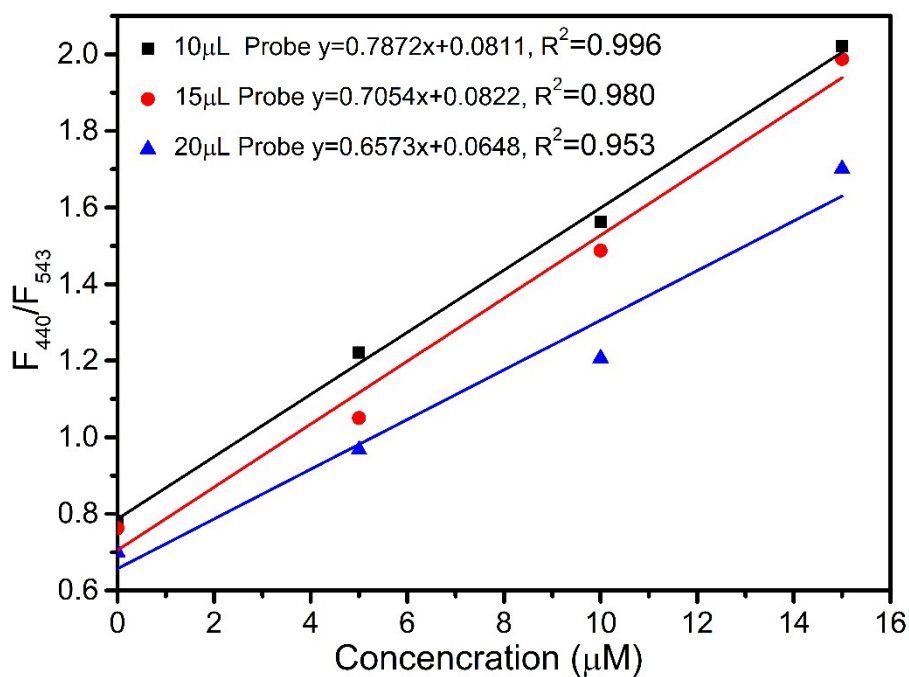


Fig. S10 The ratio fluorescence curves of reactions with hydrogen sulfide (0, 5, 10, 15 μM , respectively) at three probe concentrations.

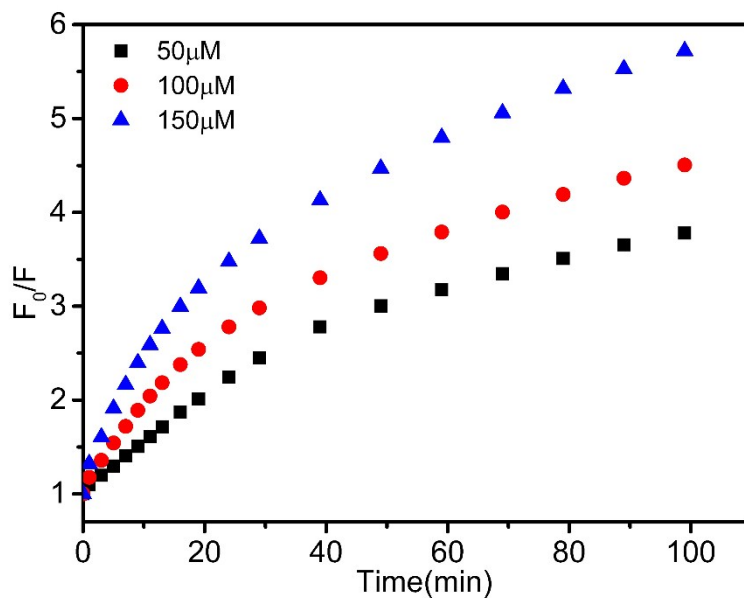


Fig. S11 Time courses of the responses between fluorescence probe (5 μ L) with H₂S at different concentrations (50, 100, 150 μ M, respectively) in 3 mL PBS solution (pH 6.64), λ_{ex} =340 nm, λ_{em} =543 nm.

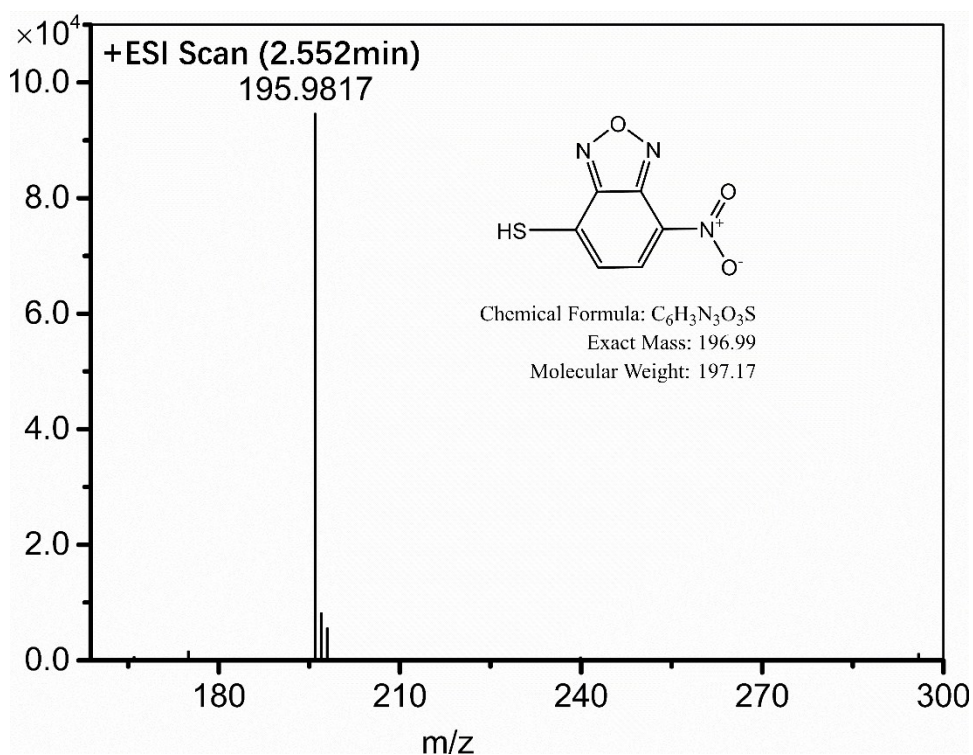


Fig. S12 LC-MS spectrum of NBD-SH. P-NBD in Methanol (2 ml) and 100 μ L 100 mM Na₂S were co-incubated for 2 h at room temperature. Then the reaction mixture was submitted into LC-MS without purification.