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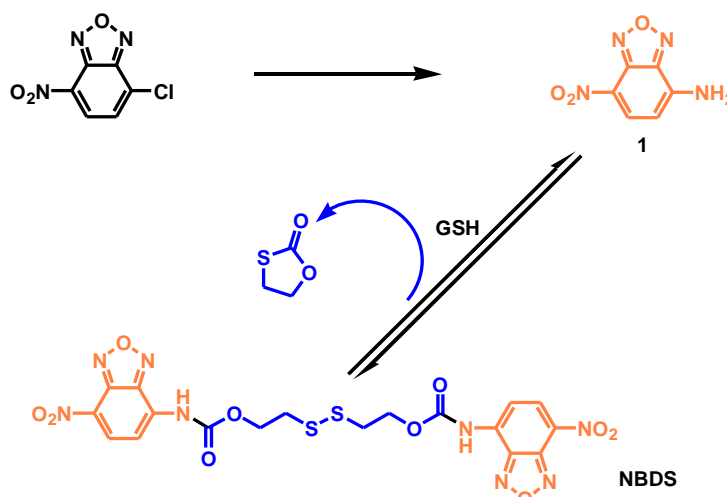
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A New Turn-on Fluorescent Sensor for the Detection of Biological Thiols based on the Benzoxazole Dye

Abstract

Detection of significant chemical and biochemical analytes by fluorescent sensor is one of the most active research fields in application of principles of fluorescence spectroscopy. In this research, we have developed a new biothiols fluorescent “turn-on” probe (**NBDS**) based on the benzoxazole dye. **NBDS** is weakly fluorescent originally and cleavage of disulfide with biothiols induced fluorescent enhancement. At the same time, absorption wavelength blue shift from 550 nm to 430 nm, the color changes from red to yellow-green. **NBDS** has a good selectivity for biological thiols. The detection limit to cysteine reaches 5×10^{-7} M, we also demonstrated the mechanism by ^1H NMR titration.

Keywords: biothiols, benzoxazole, fluorescent, sensor



Scheme 1. Design of biothiols sensor **NBDS**.

Figures

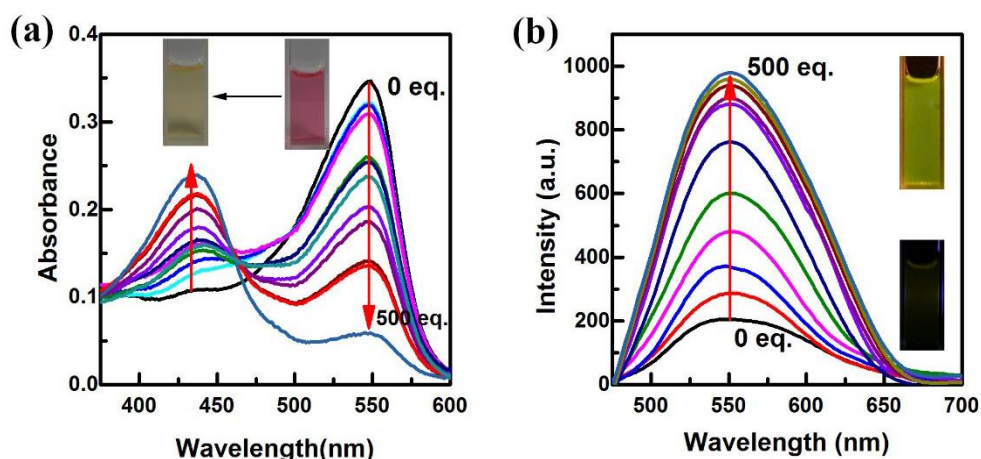


Figure 1: (a) Absorption titration spectra; (b) fluorescent spectra of **NBDS** upon addition of 0–500 eq. of **GSH**, $\lambda_{\text{ex}}=430\text{nm}$.

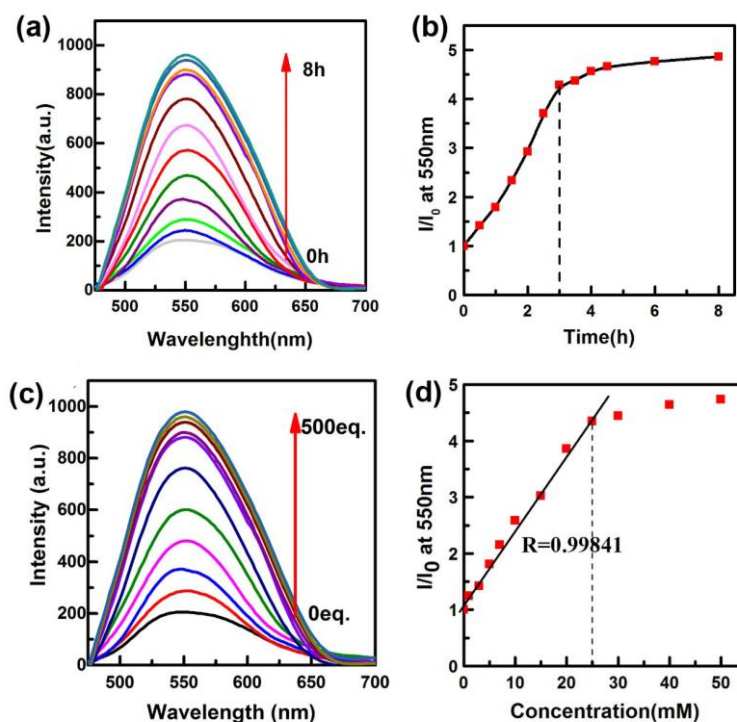


Figure 2: (a) Emission spectra of **NBDS** (10 μ M) reacted with 250 eq. of **GSH**; (b) fluorescence intensity changes of **NBDS** titrated with 250 eq. **GSH** at 550 nm recorded as a function of time; (c) fluorescent spectra of **NBDS** upon addition of 0–500 eq. of **GSH**; (d) fluorescence intensity of **NBDS** at 550 nm in the presence of various concentrations of **GSH**.

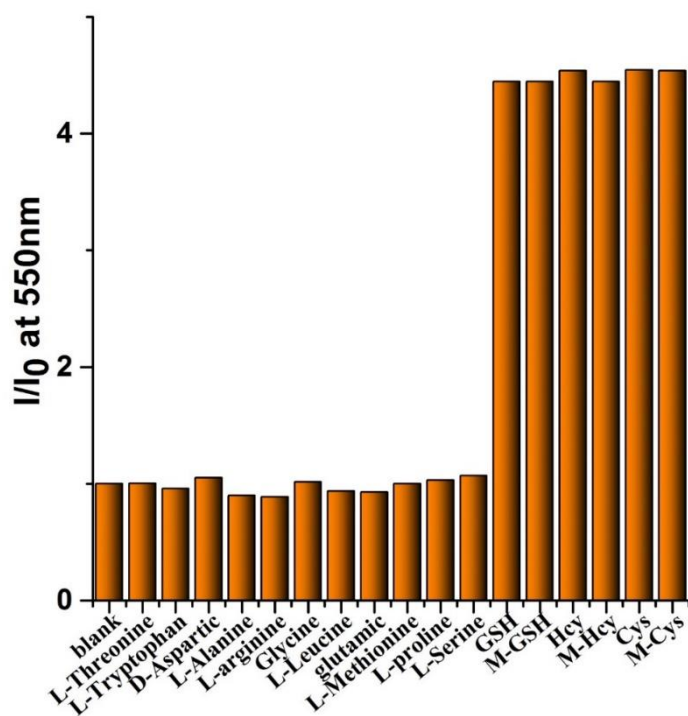


Figure 3: Selectivity of **NBDS** towards various analytes.

References

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