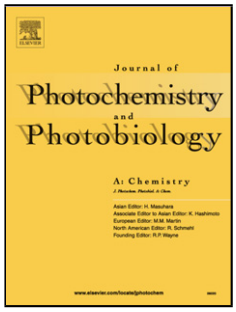

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A new "on-off-on" fluorescent sensor for cascade recognition of Hg^{2+} and S^{2-} ion in aqueous medium

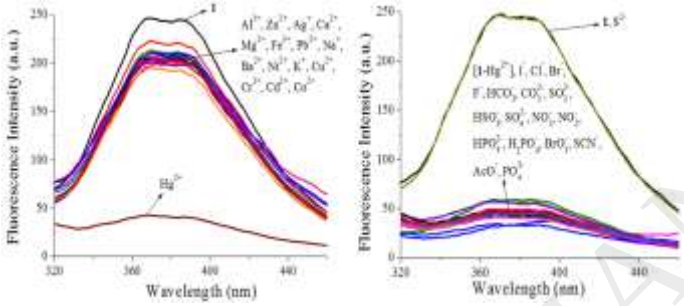
Liyan Wang,* Ying Tian, Xianyou He, Bing Zhao, Wenhui Ma, Jia Yang, Bo Song

College of Chemistry and Chemical Engineering, Qiqihar University, 42 WEN HUA road, Jianhua District, Qiqihar, 161006, China

*Corresponding authors: L. Wang

E-mail address:wlydlm@126.com

Graphical Abstract



A new fluorescent "on-off-on" sensor for cascade recognition of Hg^{2+} and S^{2-} ion in 100% aqueous medium.

Highlights

- The sensor **1** we reported can cascade recognition of Hg^{2+} and S^{2-} ion in 100% aqueous medium.
- The fluorescent detection limits of sensor **1** for Hg^{2+} is 0.41 nM.
- This "on-off-on" switching process could be repeated five times with little fluorescent efficiency loss.

Abstract: A novel Hg^{2+} ion fluorescent sensor **1** has been synthesized based on amide group, sensor **1** showed a highly sensitive and selective response towards Hg^{2+} over other metal ions by reversibly forming a [**1**-Hg^{2+}] complex in 100% aqueous solution. The fluorescence detection limits was 0.41 nM. The Job's plots, the MS analysis and ^1H NMR titration experiments implied that there was only the formation of a **1**/Hg^{2+} complex with 1:1 stoichiometry. Moreover, S^{2-} ion can remove Hg^{2+} from the complex and restore the spectral signal of **1**. This research may enrich the field of multi-functional chemosensors in natural products.

Keywords: Amide group; Cascade recognition; Mercury ion; Sulfide ion