

Accepted Manuscript

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

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



PII: S1010-6030(18)30198-9
DOI: <https://doi.org/10.1016/j.jphotochem.2018.03.037>
Reference: JPC 11206

To appear in: *Journal of Photochemistry and Photobiology A: Chemistry*

Received date: 12-2-2018
Revised date: 20-3-2018
Accepted date: 22-3-2018

Please cite this article as: Liyan Wang, Ying Tian, Xianyou He, Bing Zhao, Wenhui Ma, Jia Yang, Bo Song, A new “on-off-on” fluorescent sensor for cascade recognition of Hg^{2+} and S^{2-} ion in aqueous medium, *Journal of Photochemistry and Photobiology A: Chemistry* <https://doi.org/10.1016/j.jphotochem.2018.03.037>

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

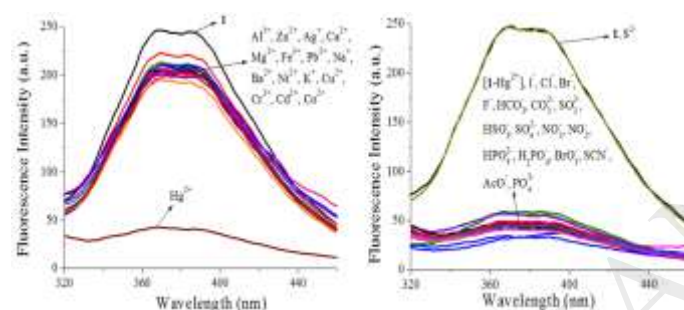
Liyan Wang,* Ying Tian, Xianyou He, Bing Zhao, Wenhui Ma, Jia Yang, Bo Song

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 $[\mathbf{1}\text{-Hg}^{2+}]$ 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 $\mathbf{1}/\text{Hg}^{2+}$ 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

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