

## Accepted Manuscript

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PII: S1386-1425(18)30659-0  
DOI: doi:[10.1016/j.saa.2018.07.006](https://doi.org/10.1016/j.saa.2018.07.006)  
Reference: SAA 16275

To appear in: *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*

Received date: 18 February 2018  
Revised date: 30 June 2018  
Accepted date: 5 July 2018

Please cite this article as: Huanhuan Fan, Guo Qiang Xiang, Yule Wang, Heng Zhang, Keke Ning, Junyue Duan, Lijun He, Xiuming Jiang, Wenjie Zhao, Manganese-doped carbon quantum dots-based fluorescent probe for selective and sensitive sensing of 2,4,6-trinitrophenol via an inner filtering effect. Saa (2018), doi:[10.1016/j.saa.2018.07.006](https://doi.org/10.1016/j.saa.2018.07.006)

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Manganese-doped carbon quantum dots-based fluorescent probe for selective and sensitive sensing of 2,4,6-trinitrophenol via an inner filtering effect

Huanhuan Fan, Guo Qiang Xiang\*, Yule Wang, Heng Zhang, Keke Ning, Junyue Duan, Lijun He, Xiuming Jiang, Wenjie Zhao

School of Chemistry and Chemical Engineering, Henan University of technology, Zhengzhou, 450001, P.R. China

\*E-mail: xianggq@haut.edu.cn

**ABSTRACT**

In the present work, a selective and sensitive method for detecting TNP using manganese doped carbon quantum dots (Mn-CDs) was developed. The Mn-CDs were prepared via a simple hydrothermal method using 1-(2-pyridinylazo)-2-naohtalenol naohtalenol (PAN) and  $\text{MnCl}_2$  as precursors. The as-prepared Mn-CDs have UV emission with high quantum yield (83.2%). Because of the strong characteristic absorption of TNP at 356 nm, which has good spectral overlap with the emission peak of Mn-CDs, the fluorescence intensity of Mn-CDs at 360 nm is linearly quenched in the presence of TNP in the concentration range of 0.1-200  $\mu\text{M}$ . The developing assay based on an inner filter effect (IFE) mechanism for detecting TNP is selective, convenient, and shows that the as-prepared Mn-CDs have application prospects for simple and specific analytical chemistry.

**Keywords:** carbon quantum dots, trinitrophenol, inner filtering effect, water samples

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