

Accepted Manuscript

Highly sensitive oligothiophene-phenylamine-based dual-functional fluorescence “turn-on” sensor for rapid and simultaneous detection of Al³⁺ and Fe³⁺ in environment and food samples



Zongrang Guo, Qingfen Niu, Tianduo Li

PII: S1386-1425(18)30321-4
DOI: doi:[10.1016/j.saa.2018.04.022](https://doi.org/10.1016/j.saa.2018.04.022)
Reference: SAA 15979

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

Received date: 25 February 2018
Revised date: 31 March 2018
Accepted date: 10 April 2018

Please cite this article as: Zongrang Guo, Qingfen Niu, Tianduo Li , Highly sensitive oligothiophene-phenylamine-based dual-functional fluorescence “turn-on” sensor for rapid and simultaneous detection of Al³⁺ and Fe³⁺ in environment and food samples. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Saa(2017), doi:[10.1016/j.saa.2018.04.022](https://doi.org/10.1016/j.saa.2018.04.022)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Highly sensitive oligothiophene-phenylamine-based dual-functional fluorescence "turn-on" sensor for rapid and simultaneous detection of Al³⁺ and Fe³⁺ in environment and food samples

Zongrang Guo, Qingfen Niu*, Tianduo Li

Shandong Provincial Key Laboratory of Fine Chemicals, School of Chemistry and Pharmaceutical Engineering, Qilu University of Technology (*Shandong Academy of Sciences*), Jinan 250353, People's Republic of China

ABSTRACT

Developing low-cost and efficient sensors for rapid, selective and sensitive detection of the transition metal ions in environmental and food science is very important. In this study, a novel dual-functional fluorescent "turn-on" sensor **3TP** based on oligothiophene-phenylamine Schiff base has been synthesized for discrimination and simultaneous detection of both Al³⁺ and Fe³⁺ ions with high selectivity and anti-interference over other metal ions. Sensor **3TP** displayed a very fast fluorescence-enhanced response towards Al³⁺ and Fe³⁺ ions with low detection limits (0.177 μM for Al³⁺ and 0.172 μM for Fe³⁺) and wide pH response range (4.0–12.0). The Al³⁺/Fe³⁺ sensing mechanisms were investigated by fluorescence experiments, ¹H NMR titrations, FT-IR and ESI-MS spectra. Importantly, sensor **3TP** was served as an efficient solid material for the highly sensitive and selective detection of Fe³⁺ on TLC plates. Moreover, the sensor **3TP** has been successfully used to detect trace Al³⁺ and Fe³⁺ in environment and food samples with satisfactory results and good recoveries, revealing a convenient, reliable and accurate method for Al³⁺ and Fe³⁺ analysis in real samples.

Keywords : Fluorescent sensor; oligothiophene-phenylamine Schiff-base; Fe³⁺; Al³⁺; environmental sample analysis; food sample

* To whom the correspondence should be addressed

E-mail: qf_niu1216@qlu.edu.cn

Telephone: +86(531)89631760

Fax number: +86(531)89631208

Download English Version:

<https://daneshyari.com/en/article/7668712>

Download Persian Version:

<https://daneshyari.com/article/7668712>

[Daneshyari.com](https://daneshyari.com)