

Accepted Manuscript

Research paper

A new off-on fluorescent sensor for the detection of Al(III) based on a chromone-derived Schiff-base

Li-mei Liu, Zheng-yin Yang

PII: S0020-1693(17)31104-0
DOI: <https://doi.org/10.1016/j.ica.2017.09.051>
Reference: ICA 17910

To appear in: *Inorganica Chimica Acta*

Received Date: 14 July 2017
Revised Date: 19 September 2017
Accepted Date: 20 September 2017

Please cite this article as: L-m. Liu, Z-y. Yang, A new off-on fluorescent sensor for the detection of Al(III) based on a chromone-derived Schiff-base, *Inorganica Chimica Acta* (2017), doi: <https://doi.org/10.1016/j.ica.2017.09.051>

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.



A new off-on fluorescent sensor for the detection of Al(III) based on a chromone-derived Schiff-base

Li-mei Liu, Zheng-yin Yang*

*College of Chemistry and Chemical Engineering, State Key Laboratory of Applied
Organic Chemistry, Lanzhou University, Lanzhou 730000, P.R. China*

**Corresponding author. Tel: +86 931 8913515; Fax: +86 931 812582; e-mail:*

yangzy@lzu.edu.cn (Z.Y. Yang)

Abstract

A new Al^{3+} sensor, 6-ethoxychromone-3-carbaldehyde-(3-hydroxy-2-naphthalene acyl) hydrazone (L), was designed and synthesized. The sensor L could exist steadily and detect Al^{3+} in the pH range from 5.0 to 8.0 in ethanol and water (3:1, v/v). This sensor showed good selectivity and high sensitivity towards Al^{3+} in the presence of most metal ions, and a remarkable enhancement in fluorescence emission intensity at 508nm ($\lambda_{\text{ex}}=420\text{nm}$) was observed with addition of 1equiv Al^{3+} , which was attributed to the inhibition of photoinduced electron-transfer (PET) phenomenon and C=N isomerization process. With the fluorescence titration experiments and the ESI-MS spectrum data, we reached the conclusion that the binding ratio between L and Al^{3+} was 2:1. Besides, the binding constant (K_a) between L and Al^{3+} was calculated to be $9.24 \times 10^3 \text{ M}^{-1}$ and the detection limit of L for Al^{3+} was as low as $1.82 \times 10^{-7} \text{ M}$.

Key Words: Fluorescent sensor; Aluminum ion; PET; C=N isomerization

Download English Version:

<https://daneshyari.com/en/article/7750956>

Download Persian Version:

<https://daneshyari.com/article/7750956>

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