

Accepted Manuscript

Research paper

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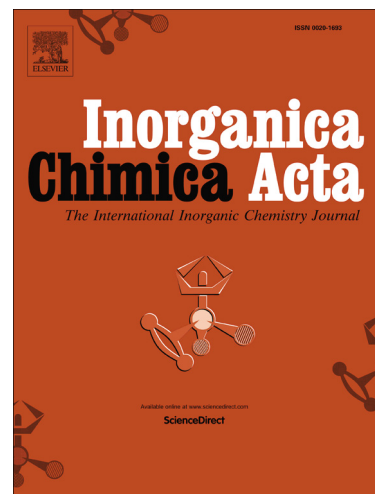
PII: S0020-1693(18)31026-0
DOI: <https://doi.org/10.1016/j.ica.2018.08.040>
Reference: ICA 18440

To appear in: *Inorganica Chimica Acta*

Received Date: 5 July 2018
Revised Date: 24 August 2018
Accepted Date: 24 August 2018

Please cite this article as: S. Maji, B. Chowdhury, S. Pal, P. Ghosh, An Indolium Ion Functionalized Naphthalimide Chemodosimeter for Detection of Cyanide in Aqueous Medium, *Inorganica Chimica Acta* (2018), doi: <https://doi.org/10.1016/j.ica.2018.08.040>

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An Indolium Ion Functionalized Naphthalimide Chemodosimeter for Detection of Cyanide in Aqueous Medium

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Abstract

A naphthalimide platform based indolium ion functionalized colorimetric as well as fluorometric chemodosimeter (**L**) has been synthesized and characterized. This can selectively sense cyanide (CN^-) in aqueous medium with a low limit of detection (approximately $0.5 \mu\text{M}$), which is around four times lower than the value of $1.9 \mu\text{M}$ set by WHO. The UV-vis and PL studies have been carried out in 40% aqueous-acetonitrile medium which shows a significant change in the visible region allowing naked eye colorimetric detection of CN^- . The mass spectrometry and $^1\text{H-NMR}$ spectroscopy are used to characterize the corresponding cyanide adduct which has also been corroborated by time-dependent density functional theory (TD-DFT) during the establishment of the sensing mechanism.

Keywords: Chemodosimeter, Cyanide sensor, Aqueous media, Colorimetric, Fluorometric, NMR titration, DFT.

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