

Accepted Manuscript

Benzimidazole-based polyheterocycles from ninhydrin: Synthesis, X-ray crystal structure and photophysical property

Suven Das, Purak Das, Suwendu Maity, Prasanta Ghosh, Bijan K. Paul, Arpita Dutta



PII: S0022-2860(18)30593-3

DOI: [10.1016/j.molstruc.2018.05.033](https://doi.org/10.1016/j.molstruc.2018.05.033)

Reference: MOLSTR 25206

To appear in: *Journal of Molecular Structure*

Received Date: 16 March 2018

Revised Date: 8 May 2018

Accepted Date: 9 May 2018

Please cite this article as: S. Das, P. Das, S. Maity, P. Ghosh, B.K. Paul, A. Dutta, Benzimidazole-based polyheterocycles from ninhydrin: Synthesis, X-ray crystal structure and photophysical property, *Journal of Molecular Structure* (2018), doi: 10.1016/j.molstruc.2018.05.033.

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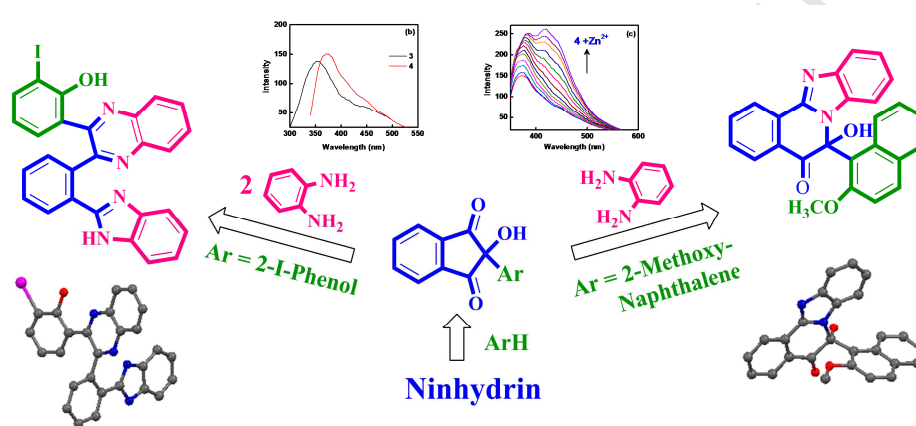
Suven Das^{a,*}, Purak Das^a, Suwendu Maity^b, Prasanta Ghosh^b, Bijan K. Paul^c, Arpita Dutta^d

^a Department of Chemistry, Rishi Bankim Chandra College for Women, Naihati, 24-Parganas (N), Pin-743165, India, e-mail: suvenchem@yahoo.co.in

^b Department of Chemistry, R K Mission Residential College, Narendrapur, Kolkata-103, India

^c Department of Chemistry, Mahadevananda Mahavidyalaya, Barrackpore, Kolkata 700 120, India

^d Department of Chemistry, Rishi Bankim Chandra Evening College, Naihati, 24-Parganas (N), Pin-743165, India



Abstract:

Ninhydrin was successfully employed to develop two different benzimidazole-embedded heterocyclic skeletons via reaction of arylated ninhydrin and *o*-phenylenediamine under acidic condition. While ninhydrin adduct of 2-iodophenol consumed two equivalent of *o*-phenylenediamine to furnish benzimidazole linked quinoxaline skeleton, under same reaction conditions corresponding 2-methoxynaphthalene adduct afforded benzimidazo[2,1-*a*]isoquinolinone framework. The hybrid heterocycles were identified as 2-(3-(2-(1*H*-benzo[d]imidazol-2-yl)phenyl)quinoxalin-2-yl)-6-iodophenol **3** and 6-hydroxy-6-(2-methoxynaphthalen-1-yl)benzo[4,5]imidazo[2,1-*a*]isoquinolin-5(6*H*)-one **4** by IR, NMR and single crystal X-ray diffraction studies. Fluorescence measurements reveal that compound **3** and **4** display differential fluorescence behaviour, particularly towards the presence of Zn²⁺ ion.

Keywords: Ninhydrin, Heterocycles, Benzimidazole, X-ray diffraction, Fluorescence

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