



Library Indian Institute of Science Education and Research Mohali



DSpace@IISERMohali (/jspui/)

/ Publications of IISER Mohali (/jspui/handle/123456789/4)

/ Research Articles (/jspui/handle/123456789/9)

Please use this identifier to cite or link to this item: <http://hdl.handle.net/123456789/2120>

Title: Design of a Primary-Amide-Functionalized Highly Efficient and Recyclable Hydrogen-Bond-Donating Heterogeneous Catalyst for the Friedel–Crafts Alkylation of Indoles with β -Nitrostyrenes

Authors: Markad, D. (/jspui/browse?type=author&value=Markad%2C+D.)
Mandal, S.K. (/jspui/browse?type=author&value=Mandal%2C+S.K.)

Keywords: Primary-amide-functionalized
MOF Friedel–Crafts alkylation
Heterogeneous catalysis
Hydrogen-bond-donating

Issue Date: 2019

Publisher: ACS Publications

Citation: ACS Catalysis,9(4),pp.3165-3173.

Abstract: A primary-amide-functionalized metal organic framework, $\{[\text{Zn}_2(2\text{-BQBG})(\text{BDC})_2] \cdot 10\text{H}_2\text{O}\}_n$ (**1**) (in which 2-BQBG = 2,2'-(butane-1,4-diylbis((quinolin-2-ylmethyl)azanediyl))diacetamide and BDC = 1,4-benzenedicarboxylate), has been found to be a highly efficient hydrogen-bond-donating (HBD) heterogeneous catalyst for the Friedel–Crafts alkylation of indole with β -nitrostyrenes under mild reaction conditions (catalyst loading: 3 mol %; reaction conditions: 12 h and 35 °C). The catalyst can be easily separated from the reaction mixture by simple filtration for its reuse in four consecutive cycles with very little loss of activity. More importantly, the one-pot room temperature synthesis of **1** from the self-assembly of $\text{Zn}(\text{OAc})_2 \cdot 2\text{H}_2\text{O}$ and 2-BQBG (in CH_3OH) and Na₂BDC (in H_2O) can be easily scaled-up for obtaining multigram quantities in few hours. In order to showcase its versatility, the substrate scope included a variety of substituted indoles and different β -nitrostyrene derivatives forming the desired products in good to high yields. For its catalytic action, a direct proof for the key step in the proposed mechanism, based on the interaction of a primary-amide group in the 2-BQBG ligand with the nitro group of β -nitrostyrene through hydrogen bonding, is provided from the enhancement in fluorescence intensity of **1** upon successive addition of β -nitrostyrene.

URI: <https://pubs.acs.org/doi/10.1021/acscatal.8b04962>
(<https://pubs.acs.org/doi/10.1021/acscatal.8b04962>)
<http://hdl.handle.net/123456789/2120> (<http://hdl.handle.net/123456789/2120>)

Appears in Research Articles (/jspui/handle/123456789/9)
Collections:

Files in This Item:

File	Description	Size	Format
Need to add pdf.odt (/jspui/bitstream/123456789/2120/1/Need%20to%20add%20pdf.odt)		8.63 kB	OpenDocument Text

[View/Open \(/jspui/bitstream/123456789/2120/1/Need%20to%20add%20pdf.odt\)](#)

[Show full item record \(/jspui/handle/123456789/2120?mode=full\)](#)

[Statistics \(/jspui/handle/123456789/2120/statistics\)](#)

Items in DSpace are protected by copyright, with all rights reserved, unless otherwise indicated.