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Research Article

Preparation, characterization and catalytic application of Zn-based metal–organic framework catalyst for synthesis of 3,3-(arylmethylene)bis-1*H*-indole derivatives

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Abstract

BACKGROUND

A mesoporous zinc-based pyridine-2,5-dicarboxylate metal–organic framework (Zn-based MOF) catalyst was prepared by a solvothermal method. The catalytic potency of Zn-based MOF for the one-pot synthesis of 3,3-(arylmethylene)bis-1*H*-indole derivatives was investigated.

RESULTS

Various analytical techniques were used to characterize the physicochemical structure of Zn-based MOF catalyst, including powder X-ray diffraction, thermogravimetric analysis, scanning electron microscopy–energy-dispersive X-ray analysis, Fourier transform infrared spectroscopy and Brunauer–Emmett–Teller surface area analysis. Zn-based MOF was then employed as a catalyst for the catalytic one-pot transfer synthesis of 3,3-(arylmethylene)bis-1*H*-indole derivatives. Optimizations of Zn-based MOF catalyst in terms of effect of solvent and reaction time were investigated.

CONCLUSIONS

Zn-based MOF catalyst was synthesized by solvothermal treatment, characterized and used as a Lewis acid catalyst for the synthesis of biologically active 3,3′-(arymethylene)bis-1*H*-indole derivatives. The catalyst offers notable benefits such as

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was confirmed as containing tetragonal phase with large pore diameter, morphology looking like a spherical core and exhibiting no significance loss of catalytic performance when used in organic synthesis for three to four reaction runs. Thereby Zn-based MOF was evidenced as showing excellent catalytic activity. © 2022 Society of Chemical Industry (SCI).

Supporting Information

Filename	Description
jctb7071-sup-0001-supinfo.docx Word 2007 document , 4 MB	**Appendix S1**: Supporting Information.

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