Enhancement of catalytic activity of MOF-74 by providing extra open metal sites for cyanosilylation of aldehydes

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The fabrication of metal–organic frameworks (MOFs) having many open metal sites is an important technique to enhance catalytic activity of MOF-based catalysts. Herein, well-defined and uniform rice-shaped MOF-74 microparticles having structural defects are prepared by containing two analogous organic linkers, 2,5-dihydroxy-1,4-bezenedicarboxylic acid (DHBDC) and 2-hydroxy-1,4-benzenedicarboxylic acid (HBDC), within the MOF-74 structure. The replacement of some of DHBDC linkers within MOF-74 by HBDC linkers result in the structural defects and which provide the extra open metal sites within MOF-74. These extra open metal sites within MOF-74 display the enhanced catalytic activity for the cyanosilylation of several aldehydes. In addition, a series of defected MOF-74s is prepared with various blending ratio of DHBDC and HBDC to determine the best catalytic performance and defected MOF-74 displays excellent recyclability for the catalytic reaction.[1]

Reference

[1] Jun H et al. Enhanced catalytic activity of MOF-74 via providing additional open metal sites for cyanosilylation of aldehydes. Sci Rep. 2022;12:14735.