

Synthesis and catalytic applications of metal-organic framework nanocomposite modified by ferric ions containing sandwich polyoxometalate

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In this thesis, B-type sandwich polyoxometalate of $[(PW_9O_{34})_2Fe_4(H_2O)_2]^{6-}$ was immobilized into porous composite cavities of Cr-MIL-101 by simple anion exchange [1, 2]. The formation of $P_2W_{18}Fe_4@MIL-101$ nanocomposite was confirmed by FT-IR, TGA, BET, SEM, EDX, ICP, BET and powdery XRD methods. The catalytic activity of nanocomposites was investigated in oxidation of sulfides to sulfones with H_2O_2 at room temperature [3]. The effect of temperature on stability and catalytic activity of the $P_2W_{18}Y_3@MIL-101$ was investigated. The effects of different dosages of catalyst, type of solvent, reaction time, amount of oxidant in this catalytic system were investigated. The new $P_2W_{18}Fe_4@MIL-101$ nanocomposite exhibited well recyclability and reusability in at least five consecutive reaction cycles without significant loss of activity or selectivity.

Keywords: B-type sandwich polyoxometalate, Cr-MIL-101, Sulfides, Homogeneous and heterogeneous catalysts

References

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