

A detailed study of the catalytic performance of V, Co and Cu MOFs in the oxidation of cyclohexene

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In this research, the catalytic performance of V-, Co- and Cu-MOFs, prepared with 1,4-benzenedicarboxylic (BDC) and/or 1,3,5-benzenetricarboxylic (BTC) ligands, is discussed for the oxidation of cyclohexene. Several parameters have been examined, for example: solvent, temperature and oxidans. The detailed product distributions and recyclability of these materials are discussed. Surprisingly, the highest conversions and highest yields of epoxide are achieved with the coordinatively saturated V-MOF, MIL-47. Indeed, these MOFs have a completely different geometry and coordination of the metal centre, which will be discussed in relation to the catalytic results. The Cu-MOFs studied have a Cu₂ or Co₂ paddle-wheel structure in which the metal centres have a square coordination to bidentate carboxylate ligands. The latter can be unsaturated (activated CuBTC and CuBDC) or saturated (CoBDC-DABCO). The studied V-MOF, MIL-47, has a three-dimensional orthorhombic structure in which every V centre is completely saturated [1].

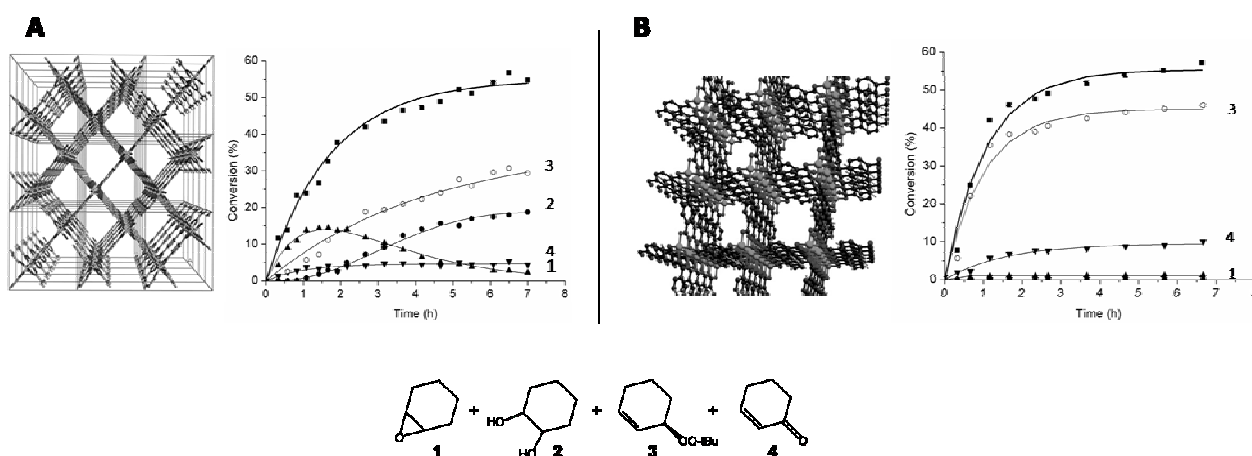


Figure: Structure and product distribution of (A) MIL-47 and (B) Cu(tpa) [2]

1 K. Barthelet, J. Marrot, D. Riou, G. Férey, *Angew. Chem. Int. Ed.*, 2002, **41**, 281.

2 C.G.Carson et al, *Eur. J. Inorg. Chem.*, 2009, 2338.