

Synthesis, characterization, adsorption and catalytic properties of an amino functionalized Metal Organic Framework: NH₂-MIL-47 (V)

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In recent years MOFs have become more and more a topic of interest in heterogeneous catalysis^{1,2}. The rigidity of some MOFs allows further functionalization without changing the original topology, either by a post-functionalization or by the use of a prefunctionalized linker. This way, subtle changes can be induced in the catalytic or sorption properties. In this contribution, we report on the synthesis of the amino functionalized V-MOF with MIL-47 topology. This NH₂-MIL-47 is fully characterized. The CO₂ and CH₄ adsorption properties of this NH₂-MIL-47 have been investigated and are compared to the parent MIL-47 (Fig.1 A). It is concluded that amino groups only enhance the CO₂ adsorption in MOFs if they influence the flexibility of the network, which is not the case in the rigid NH₂-MIL-47³. Moreover, the NH₂-MIL-47 was post-functionalized with TiO(acac)₂ (Fig.1 B). The resulting [Ti] NH₂-MIL-47 is being tested for its photocatalytic performance in the oxidation of cyclohexene using molecular oxygen as oxidant.

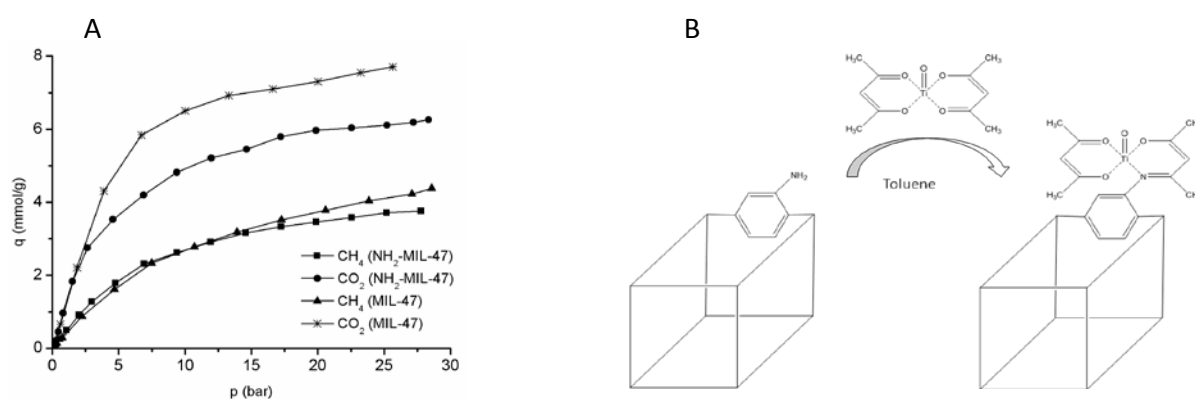


Fig 1 A) Adsorption isotherms of CO₂ and CH₄ on MIL-47 and NH₂-MIL-47 B) Post-functionalization of NH₂-MIL-47 with TiO(acac)₂

[1] Leus et al, ChemComm, **2010**, 2010, 46, 5085–5087, [2] Leus et al, J. Catal, **2012**, 285, 196-207.

[3] Leus et al., Langmuir (submitted)