

# Synthesis, characterization, adsorption and catalytic properties of an amino functionalized Metal Organic Framework: NH<sub>2</sub>-MIL-47 (V)

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In recent years MOFs have become more and more a topic of interest in heterogeneous catalysis<sup>1,2</sup>. 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 NH<sub>2</sub>-MIL-47 is fully characterized. The CO<sub>2</sub> and CH<sub>4</sub> adsorption properties of this NH<sub>2</sub>-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 CO<sub>2</sub> adsorption in MOFs if they influence the flexibility of the network, which is not the case in the rigid NH<sub>2</sub>-MIL-47<sup>3</sup>. Moreover, the NH<sub>2</sub>-MIL-47 was post-functionalized with TiO(acac)<sub>2</sub> (Fig.1 B). The resulting [Ti] NH<sub>2</sub>-MIL-47 is being tested for its photocatalytic performance in the oxidation of cyclohexene using molecular oxygen as oxidant.

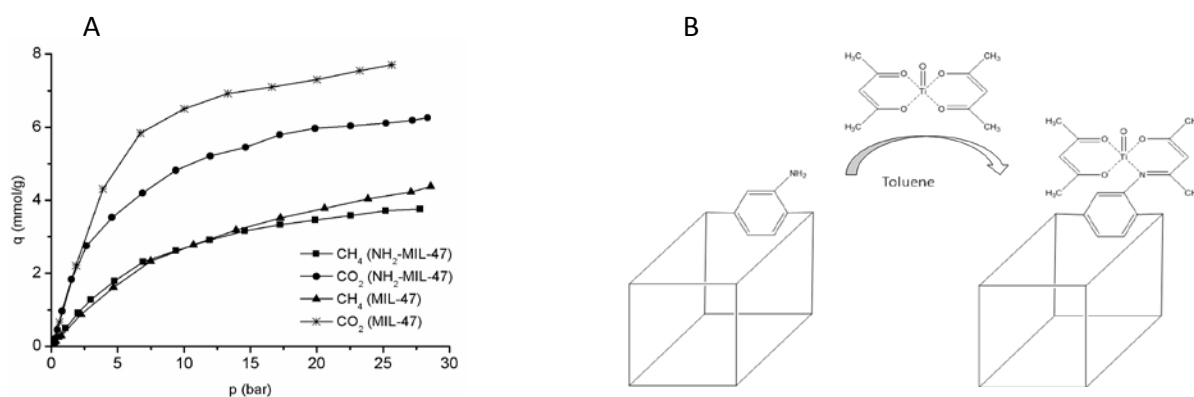


Fig 1 A) Adsorption isotherms of CO<sub>2</sub> and CH<sub>4</sub> on MIL-47 and NH<sub>2</sub>-MIL-47 B) Post-functionalization of NH<sub>2</sub>-MIL-47 with TiO(acac)<sub>2</sub>

[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)