

Poster Presentation

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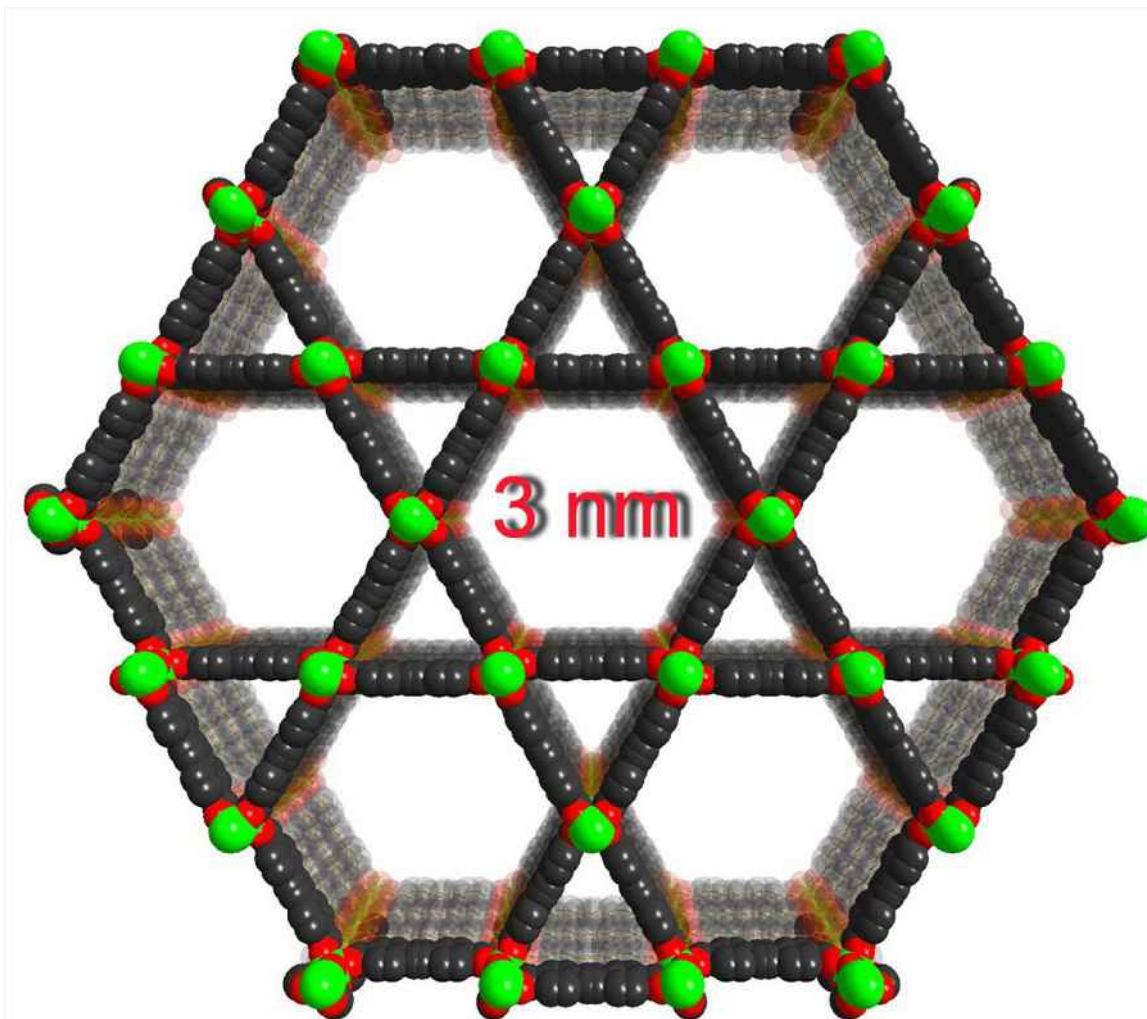
Synthesis and Gas Storages of Mesoporous Aluminium Metal-Organic Frameworks

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Two mesoporous metal-organic framework of [Al(OH)(SDC)] (CYCU-3) and [Al(OH)(SDC)] (CYCU-4), (H₂SDC = 4,4'-stilbenedicarboxylic acid) were synthesized between Al(III) ions and H₂SDC under solvothermal reactions. The two crystals have same formula with different topology as supramolecular isomerisms and form 3D mesoporous frameworks in which carboxylate oxygen on each terminus of the ligand forms AlO₆ octahedra by cornered-sharing to come into 1D inorganic chain. Further gas sorption measurements also exhibit highly porous properties and uptake capacities of H₂ (8.22 and 7.36 mmol/g at 77 K and 1 atm) and CO₂ (1.54 and 1.66 mmol/g at 298 K and 1 atm; 2.83 and 2.65 mmol/g CO₂ at 273 K and 1 atm). As verified by N₂ sorption measurements, the CYCU-3 exhibits the largest pore volume (1.39 cm³g⁻¹) and the largest open channels (3.0 nm) in the system of Al-MOFs reported to date. The CYCU-4 has about 2.1 nm open channels and large pore volume of 1.20 cm³g⁻¹.

[1] S.-H. Lo, C.-H. Chien, Y.-L. Lai, et al., *J. Mater. Chem. A*, 2013, 1, 324–329., [2] W.-L. Liu, S.-H. Lo, B. Singco, et al., *J. Mater. Chem. B*, 1, 928 - 932.



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