Research on Metal Organic Framework for clean energy storage, fuel cells, heterogeneous catalysis

Assoc. Prof. Thang Bach Phan

Center for Innovative Materials and Architectures (INOMAR), Vietnam National University HoChiMinh City (VNUHCM)

The INOMAR Center is currently developing the next generation of porous, crystalline materials. We employ the principles of reticular chemistry, whereby inorganic clusters (and/or metals) are linked with organic struts through strong bonds in a geometrically controlled fashion. Furthermore, the flexibility we have in choosing these building units, affords the resulting materials with unique opportunities for fine-tuning their pore metrics and environment, surface area, and overall topology. Our primary focus, with respect to research conducted, is the discovery of new extended, porous metal-organic frameworks (MOFs) and zeolitic imidazolate frameworks (ZIFs) for applications in Gas Storage and Separation, Catalysis and Conductivity [1-4],...In addition, we are also developing new thermoelectric based oxide materials [5] and resistive random access memory based hybrid nanocomposites [6].

[1] Enhancing Proton Conductivity in a Metal-Organic Framework at T > 80 degree celsius Anchoring Strategy, *RSC J. Mater. Chem. A. 6, 1816-1821 (2018).*
[2] New Metal-Organic Frameworks for Chemical Fixation of CO2, *ACS Appl. Mater. Interfaces. 10 (1), 733-744 (2018).*
[3] A new superacid hafnium-based metal-organic framework as a highly active heterogeneous catalyst for the synthesis of benzoxazoles under solvent-free condition, *RSC Catal. Sci. Technol., 7, 4346-4350 (2017).*
[4] A Titanium–Organic Framework: Engineering of the Band Gap Energy for Photocatalytic Property Enhancement, *ACS. Catalysis, 7, 338-342 (2017).*
[5] Effect of annealing temperature on thernoelectric properties of Ga and In dually doped-ZnO thin films, *Journal of Alloys and Compounds. 747, 156-165 (2018).*
[6] Comprehensive resistive switching behavior of hybrid polyvinyl alcohol and TiO2 nanotube nanocomposites from combining experimental and density funtional theory studies, *RSC J. Mater. Chem. C, 6, 1971-1979 (2018).*