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***IMCN SEMINAR***

***« Metal Organic Frameworks built up from  
(poly)phenolate ligands: challenges and  
opportunities »***

**Thursday 6 June 2019 – 11:00 am  
Auditorium LAVO 51 (Lavoisier building)**

Place L. Pasteur, 1, 1348 Louvain-La-Neuve

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### ABSTRACT

Porous Coordination Polymers or Metal Organic Frameworks (MOFs) belong to one of the most recent class of porous materials, and have been proposed in various fields of application, ranging from gas storage and capture to heterogeneous catalysis and controlled drug release. Whereas the broad variety of available organic and inorganic building units should lead to a huge diversity of accessible materials with tunable structures and porosities, most MOFs "blockbusters" (e.g. HKUST-1, MIL-100, UiO-66,...) derived from solely from few simple poly-carboxylate ligands. There is nevertheless still a rising interest in the development of new MOFs built up from alternative complexing groups, not only because of the structural diversity they offer, but also because of the properties they can afford. In the last years, we focused our attention of the use of phenolate derived ligands,[1-3] which combine noticeable advantages: a very good compatibility with highly charged oxophilic cations, a stronger basicity than carboxylate groups and a redox activity (phenol/quinone redox couple). These features could lead to exceptionally high chemical stability, as well as unusual (opto)electronic properties. We will here discuss the reactivity of such ligands with both endogenous bio-friendly cations (Mg, Ca)[1] and highly charged ones (Ti, Zr),[2,3] with a specific interest in identifying robust inorganic secondary building units suitable to design new materials. The in depth structural characterization of these solids, mostly by the combination of X-ray diffraction and solid state NMR analysis, will also be presented, together with their properties (chemical stability, catalytic activity, redox behavior,...).

#### References

- [1] L. Cooper et al., *Chem. Commun.* **2015**, 51, 5848; T. Hidalgo et al., *J. Mater. Chem. B.* **2017**, 5, 2813  
 [2] L. Cooper et al., *Eur. J. Inorg. Chem.* **2014**, 6281 ; G. Mouchaham et al., *Angew. Chem. Int. Ed.* **2015**, 54, 13297; G. Mouchaham et al., *Chem. Commun.* **2017**, 53, 7661  
 [3] H. Assi et al., *Inorg. Chem.* **2016**, 55, 7192; H. Assi et al., *Polyhedron* **2018**, 156, 111

### BIOGRAPHY

Thomas Devic studied Chemistry at the Ecole Normale Supérieure de Lyon and received his PhD in 2003 from the University of Angers, France, in the field of conducting molecular materials. After a postdoctoral stay at the Cornell University, USA, in the group of Prof. Stephen Lee (2003-2004), he was appointed as a CNRS researcher in the research group "Porous Solids" headed by Gerard Férey at the Institut Lavoisier de Versailles, France. In 2016, he moved to the Institut des Matériaux Jean Rouxel, Nantes, France. His research mainly deals with the synthesis, structural characterization and study of the properties of new hybrid solids, with a special emphasis on the use of non-conventional ligands, in-situ studies and structure-properties relationships, and more recently their applications in the field of electrochemical energy storage

