New electrode materials based on alloxazine derivatives

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Metal-Organic Frameworks (MOFs) are well known for their porosity and their properties for adsorbing gas, delivering drugs, or storing energy[1]. We aim to propose new redox active core centered on their organic part of the MOFs, which will contribute to their electronic or ionic conductivities for energy storage devices.

We focused on the use of Alloxazines, bio-inspired compounds, that are allowing the presence of three stable redox states[2], the alloxazine motif promoted as ligand can be a promising candidate for synthesizing new redox active MOFs.

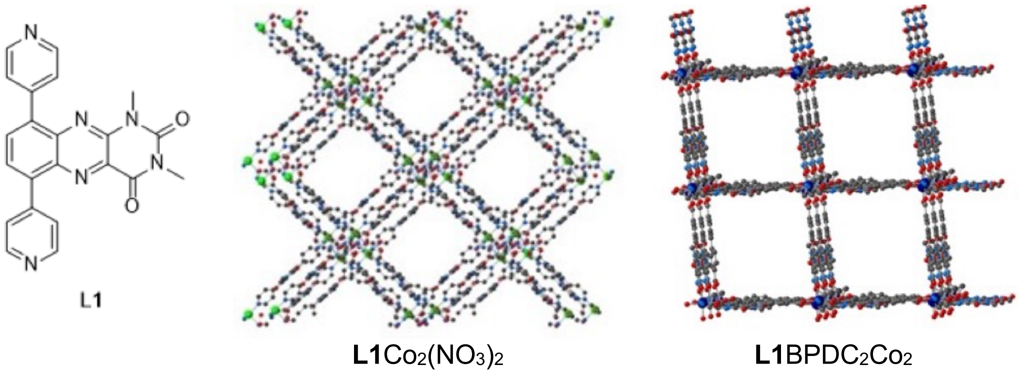

Figure 1 : a) Redox active organic ligand containing an alloxazine core, b) Coordination polymers based on alloxazine core obtaining by the two component strategy c) MOFs based on alloxazine core obtaining by the three-components strategy (BPDC : 4,4'-BiPhenylDiCarboxylic acid).

We have successfully synthesized a large library of organic ligand favorizing the MOFs formation (**Figure 1a**), based on the alloxazine core. By combining them with a metal salt, coordination polymers containing the alloxazine core have been formed (**Figure 1b**). Then by using a three components strategy[3] (by combining two different organic ligands and one metal salt) we obtained series of robust bi and tridimensional Metal Organic Frameworks (**Figure 1c**).

The physico-chemical and electrochemical properties of these new MOFs have been studied in the solid state. They present a certain porosity allowing them to adsorb and release gas. Some of them have been also used as electrode materials in ionic batteries.

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