Porous Coordination Polymers (PCPs) based (bi)pyridinium ligands for gas storage and chemical sensor applications

Titre	Porous Coordination Polymers (PCPs) based (bi)pyridinium ligands for gas storage and chemical sensor applications
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Mots-clés	bipyridinium [6], gas storage [7], molecular recognition [8], porous coordination polymers [9], Redox active ligands [10]
Résumé en anglais	PCPs (Porous Coordination Polymers) or MOFs (Metal Organic Frameworks) are crystalline materials whose structures consist of metal-based nodes bridged by organic linking groups. They are a well known class of porous materials which can have applications in gas storage (H2, CH4, CO2…), heterogeneous catalysis and chemical sensors.1 Up to now the main strategy to increase the absorption properties has been to introduce coordinatively unsaturated metal centres. In contrast, the incorporation of cationic organic ligands is much rarer despite a certain potential as shown by some reports.2 Our original approach consists of mixing electro-active viologen derivatives to a useful coordination function like carboxylate, which is widely used in such materials,3 to synthesize new PCPs for gas storage and molecular recognition. Those ligands are based on N-substituted-4,4’-bipyridinium monocation and N,N’-disubstituted-4,4’-bipyridinium dication carrying one or several carboxylate groups. Our synthetic strategy and new results will be described in this poster, taking the [Cd4Cl6L3](CdCl4) compound as example, with L = 4,4’-bipy-(C6H4COO)2. In addition to provide a highly stable structure upon temperature and moisture, this PCP exhibits accessible channels with a large zwitterionic surface area which allow reversible sorption properties of gas and small molecules. The obvious color shift in presence of ammonia vapors offers a high potential for chemical sensors and optical applications.
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