

Study of Modified Imine-based Covalent Organic Frameworks for its Potential Application in Fuel Cell

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Worldwide problem about the decreasing of the energy resources makes that numerous researchers focus their studies on finding new materials for applications related to the use and development of alternative energies. In this regard, covalent organic frameworks (COFs) show very interesting properties for its uses in this field. However, the fabrication of devices based on COFs is limited by the low processability of these materials. In this talk, I will report on the facile processability of a series of imine-based COFs, which can incorporate different molecules and/or ion pairs in their porous channels leading remarkable high ionic conductivities. Then, I will show the study of the ionic conductivity of these films carried out using electrochemical impedance spectroscopy. Finally, in view of the exceptional mechanical properties of these films, I will show the results obtained of the construction of proton exchange membrane fuel cells (PEMFC) using the films as solid electrolyte. Although, these performances are clearly inferior to that achieved for Nafion® based PEMFCs, they are promising, and outperforming those previously reported for similar fuel cell membranes studies using related COF materials.