Poster Presentation

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Metal-Organic Frameworks based on conjugated organic ligands for optoelectronic applications

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Metal-organic frameworks (MOFs) have attracted major research interest due to their potential in a wide range of applications. These three-dimensional networks are form by the joint between a metal cluster and an organic ligand which nature will determine the characteristics of the structure. Therefore, the appropriate design of these materials could enhance its features related with interesting application like catalysis, magnetism, gas separation and storage, sensors, drug delivery [1].

Here we report the synthesis of metal organic frameworks based on hole transport poly-conjugated ligands and different metals. . The use of electroactive organic ligands in these networks can leads to significant electronic interactions with the metal center-coordinated metal ions under light irradiation leading to an enhancement of the optoelectronic and photo-catalytic properties [2]. In addition, the selection of an adequate metal-node with relative large ionic radius, which can act with high oxidation state and empty orbitals to act like acceptor for electron transfer in also desired. Several theoretical and experimental characterization tools determined the opto-electronic and conductive properties of these MOFs structures. Transient absorption spectroscopy reveals different electron-hole recombination rates compared with the corresponding metal oxides. Moreover, photocurrent measurements reveals changes in the conductivity in function of the used metal node.

[1] H.-C. Zhou, J. R. Long, O. M. Yaghi, Chem. Rev., 2012, 112, 673-674.

[2] O. K. Farha et al, Chem. Commun., 2015,51, 3501-3510

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