

August 27-28, 2018
Zurich, SwitzerlandElena Aznar, J Org Inorg Chem 2018, Volume 4
DOI: 10.21767/2472-1123-C5-014

MESOPOROUS MATERIALS IN MASTER COURSES

Elena Aznar^{1,2}¹Centro de Investigación Biomédica en Red de Bioingeniería Biomateriales y Nanomedicina (CIBER-BBN), Spain²Instituto Interuniversitario de Reconocimiento Molecular y Desarrollo Tecnológico (IDM), Spain

Mesoporous materials are defined as porous materials with pores in the range of 2-100 nm. One of the most important class of mesoporous materials are MCM-41 silica-based materials due to their fascinating properties such as high homogeneous porosity, inertness, thermal stability, the presence of tunable pore sizes, homogeneous pore distribution and the possibility to easily functionalise the external (or internal) surface. These materials can be easily prepared with tailor-made pores of around 2 – 10 nm and show a very large specific surface area (up to 1200 m²/g), thus having a large load capacity. Additionally, their active functionalization to obtain advanced materials is a timely topic of research that could be very motivating and useful for future researchers and postgraduated students. Anchoring organic molecules, biomolecules, or supramolecules onto MCM-41 scaffoldings with different chemical natures, sizes, and shapes promotes the development of smart nanodevices that can be applied in certain scientific and technological fields such as catalysis, chemical remediation, drug delivery or sensing. For example, one attractive approach is to enhance their functionality using supramolecular concepts. It is possible to incorporate in their external surface functional groups or capping ensembles able to open or close at will for advanced controlled-release

applications. These systems are constructed for finely tuning the delivery of chemical or biochemical species from voids of porous supports to a solution in response to predefined stimuli. Such gated materials are composed mainly of two subunits: (i) the porous inorganic support in which a cargo is loaded and (ii) certain molecular or supramolecular entities, generally grafted onto the external surface, which can control mass transport from pores. On the basis of this concept, a large number of imaginative examples have been developed. Their study and the preparation of simple systems could be very significant and appreciated by master students.

Biography

Dr Elena Aznar is researcher of the Biomedical Research Center Network (CIBER) in the area of Bioengineering, Biomaterials and Nanomedicine at Instituto de Reconocimiento Molecular y Desarrollo Tecnológico in Universitat Politècnica de Valencia. She is co-author of 57 publications (h-index of 26), has participated in 22 projects and holds 2 patent. Her research interests involve the development of new functional porous materials. Specially, she works on the development of gated materials for sensing and drug delivery applications in the biomedical area.

elazgi@upvnet.upv.es