

Department of Chemistry

Multi-Responsive Supramolecular Assemblies

Photochemistry and Supramolecular Chemistry Group

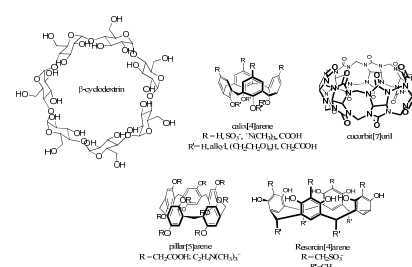


Nuno Basílio

-PhD in Chemistry from the University of Santiago de Compostela (2011).
-Postdoc at the Photochemistry and Supramolecular Chemistry Group since February 2013.
-16 publications in international peer reviewed journals and 1 patent.

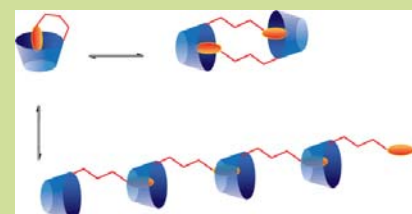
Objectives

- Study the photophysical and photochemical behavior of molecules encapsulated in macrocyclic nanocontainers.
- Development of water soluble multi-responsive supramolecular assemblies using host-guest recognition motifs as the “glue” to link the monomeric components together.
- Application of the mentioned systems as smart functional materials for the development of logic devices, sensors and controlled delivery platforms.



Methodology

- Synthesis and modification of guests and hosts molecules responsive to multiple stimuli.
- Evaluation of the stability, selectivity and stoichiometry of envisaged host-guest complexes. Identification of the ideal host-guest pairs for hierarchical self-assembly (i.e. formation of supramolecular assemblies).
- Study of the photochemical / photophysical properties of the encapsulated guests.
- Formation of supramolecular assemblies and their exhaustive characterization.
- Study of the multi-stimuli responsiveness of the supramolecular assemblies.



Expected Results

- Improving the current knowledge on the thermodynamic and kinetic stability of the complexes formed between the selected host and guest species and on the main structural and electronic factors that govern the association process.
- Identification of more suitable host-guest pairs to be applied in the construction of the aforementioned self-assembled polymers.
- Development of smart materials with improved response to multiple stimuli such as light, pH, redox potential and biochemical species.