Supramolecular host-guest recognition, polymeric systems, and photochemistry for achieving highly selective fluorescent sensors

Gianluca Utzeri[a], Telma Costa[a], Artur J. M. Valente[a], J. Sérgio Seixas de Melo[a], Alberto A.A.C. Pais[a] and Estefanía Delgado-Pinar[b]

[a] CQC-IMS, Department of Chemistry, University of Coimbra, Coimbra P-3004-535, Portugal

[b] Molecular Science Institute, Inorganic Chemistry Department, University of Valencia, C/Catedrático José Beltrán 2, 46980, Paterna, Valencia, Spain
estefania.delgado@uv.es

Photo-responsive materials with good luminescence performance in solid state have been attracting widespread attention due to their great potential applications in optical recording, data storage and anti-counterfeiting. Furthermore, for practical applications in biomedicine, chemistry, and materials, many molecules must be incorporated into a solid matrix. However, most of the times undesirable aggregation-caused quenching (ACQ) effect is usually present when concentrated samples are used.

Integrating supramolecular recognition processes with solid-state chemistry has proven to be a highly effective strategy to overcome some drawbacks like quenching of the recognition signalling, solubility of the active compound in aqueous solution, etc. Polymers, among other types of systems, have been proven to be good candidates since they provide superior control over guest molecule release through adjustments in the degree of cross-linking, along with improved chemical and thermal stability relative to their individual components.

Herein, we will discuss a couple of examples where supramolecular host-guest recognition, polymeric systems, and photochemistry as primary methodology have been used to develop highly selective chemosensors for ATP versus other nucleotides or to produce materials in different shapes and forms, with high luminescent performance

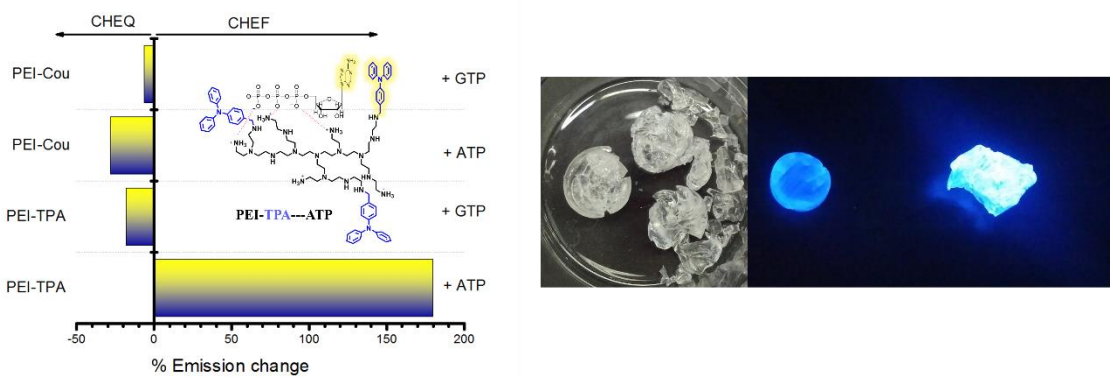

Figure 1. Left) Bar diagram representation of the % response relative fluorescence intensity of different systems after the addition of an excess of specific nucleotides. Right) Pictures of monolithic polymeric nanosponges and upon incidence of the UV-lamp.