

University of Puerto Rico
Mayagüez, Campus
Chemistry Department
Departmental Seminar

Friday, FEBRUARY 5TH , 2016
Q -123
Abbott Room
11:30 AM

By

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ABSTRACT

Designing New Paramagnetic Complexes for their Future Application in Memory Devices, Theranostics and Sensors

In the Piñero Laboratory we design new coordination molecules to be assembled in nanostructures in which their magnetic and electrochemical properties can be modulated. This seminar will be focused on our efforts in the design of paramagnetic materials that could be used in the synthesis new single molecule magnets (SMM), theranostic agents and sensors. Metal complexes with unpaired number of electrons are at the core of the materials born from the bottom-up approach in the nanoscience revolution, and thanks to their remarkable magnetic properties, their application in information storage, quantum computers, sensors and medical imaging, among a vast of emerging technologies, can be envisioned. On the topic of SMMs, salen-type ligands are synthesized for the preparation of transition metal complexes with a preferred orientation of their magnetic moments.¹ In the field of theranostics, it will be presented the use of metallodithiolene based complexes for their application in photothermal therapy to cause apoptosis to malignant cancer cells through high heat conversion efficiency. It will be discussed the possibility of including paramagnetic moieties to the metallodithiolenes for enhancing the resolution in MRI.² Thirdly, new approaches in the design of sensors from metalothalocyanines will be presented.

1. Piñero, D.; Woodruff, D. N.; Jeon, I.; Bhowmick, I.; Secu, M.; Hillard, E. A.; Dechambenoit, P.; Clérac, R, "Switching off the SMM properties of the [(CoII(Me6TREN)(OH₂)]²⁺ module by complexation with trans-[RuIII(salen)(CN)₂]⁻ " New J. Chem., 2014, 38, 3443-3448.

2. Famengo, A.; Piñero, D.; Jeannin, O.; Guizouarn, T.; Fourmigué, M., "Paramagnetic dithiolene complexes as metallo-ligands: ether/thioether coordination" Dalton Trans., 2012, 41, 1441– 1443.