UNIVERSITATEA DIN BUCUREȘTI
VIRTUTE ET SAPIENTIA

POMtriSpin

Paramagnetic polyoxometalates (POMs) as metalloligands for constructing heterotrispin complexes

PN-III-P1-1.1-TE-2016-1633 (nr. 1/2018)

Financial support: UEFISCDI

Project team:

Project leader: dr. Catalin Maxim

Members:

dr. Silviu Nastase
dr. Cristian D. Ene
student Dragos Negreanu
student Alexandru Topor

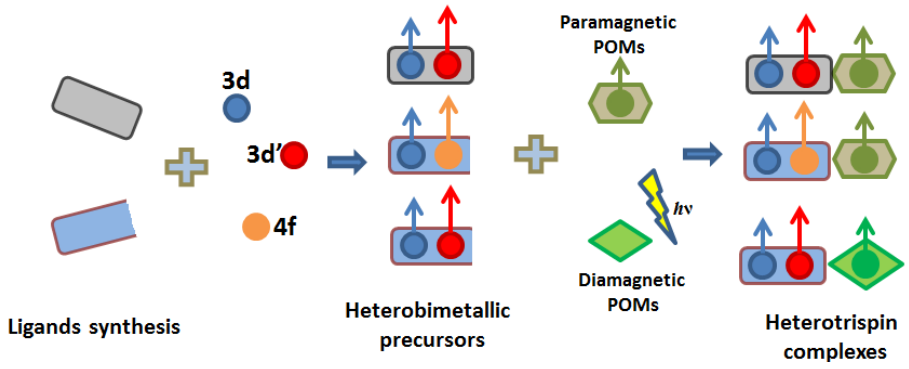
Abstract:

POMtriSpin

The present project will concentrate on the developement the synthesis and characterization of new molecular heterotrispin systems based on heterobimetallic 3d-3d' and 3d-4f precursors and paramagnetic polyoxometalates(POMs) as metalloligands by using the molecular approach strategy. This strategy focuses on POMs as ligands, and will be used for the first time in heterotrispin chemistry.

Two synthetic routes will be followed to achieve the envisaged heterotrispin networks:

- the self-assembly process involving heterobinuclear cationic complexes and paramagnetic polyoxometalates
- as a follow up of the self-assembly route, the photo-generation of the trispin complexes by photoinduced intramolecular charge transfer in POMs based organic-inorganic hybrids. New organic ligands will be synthesized in order to design new heterodinuclears precursors with easily accessible positions that favor strong interaction and flexible coordination spheres.



Objectives:

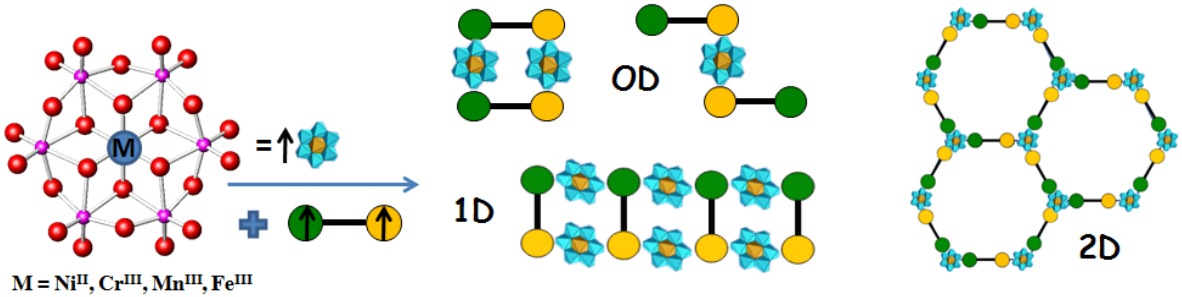
POMtriSpin

A. *Design, synthesis and characterization of new bicompartmental Schiff base ligands (macrocyclic or side-off type).*

B. *Design, synthesis and characterization of new heterobimetallic 3d-3d' and 3d-4f complexes to be further used as nodes.*

C. *Design, synthesis and characterization of new heterotrispin complexes containing paramagnetic POMs as metalloligands.*

D. *Magneto-structural correlations in heterometallic complexes.*



Dissemination of results 2018:

Conferences:

- Catalin Maxim, Cristian D. ENE, Marius Andruh, *Chiral coordination polymers containing tridentate Schiff bases ligands. Crystal structures, optical and magnetic properties,* **68th Conference of Japan Society of Coordination Chemistry** (JSCC), July 28-30, 2018, Sendai, Japan, (oral presentation)

- Cristian D. Ene, Catalin Maxim, Rodolphe Clérac, Narcis Avarvari, Marius Andruh, *Enantiopure versus racemic mixture in reversible, two-step, single-crystal-to-single-crystal transformations of copper(II) complexes, accompanied by drastic changes of the magnetic properties,* **43rd International Conference on Coordination Chemistry** (ICCC2018), July 30 -August 4, 2018 , Sendai, Japan, (oral presentation)

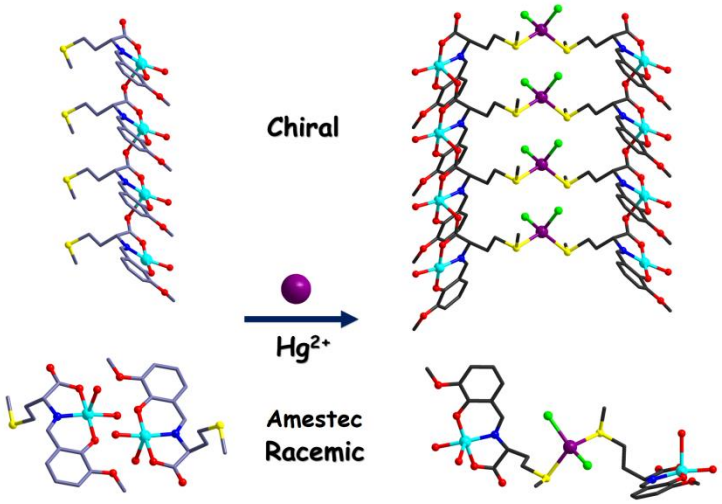
Dissemination of results 2019:

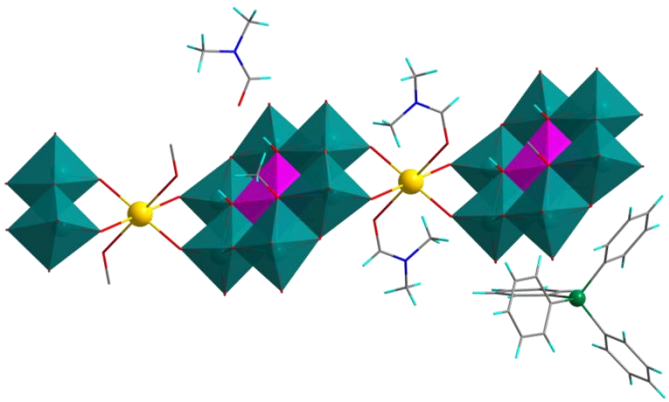
POMtriSpin

Conferences:

- **Chirality driven single-crystal-to-single-crystal transformations of copper(II) coordination polymers,** Catalin Maxim, Cristian D. Ene, Marius Andruh, 9th International Conference of the Chemical Societies of the South-East European Countries (ICOSECS9), Targoviste, 8-11 mai 2019, prezentare orală.
- **On the role played by the chirality of ligands on the aggregation of heterometallic Cu^{II}-Hg^{II} complexes,** Catalin Maxim, Marius Andruh, 21st Romanian International Conference on Chemistry and Chemical Engineering (RICCCE2019), Constanta, 4-7 Septembrie 2019 Romania, keynote lecturer.
- **Synthesis and characterization of three new asymmetric binuclear Schiff-base 3d-4f compounds** Catalin Maxim, Alexandru Topor, Marius Andruh, 9th International Conference of the Chemical Societies of the South-East European Countries (ICOSECS9), Targoviste, 8-11 mai 2019, poster.
- **Constructing heterotrispin systems by employing Anderson polyoxoanions,** Catalin Maxim, Cristian D. Ene, Diana Trandafir, Dragos Negreanu, 21st Romanian International Conference on Chemistry and Chemical Engineering (RICCCE2019), Constanta, 4-7 Septembrie 2019 Romania, poster.

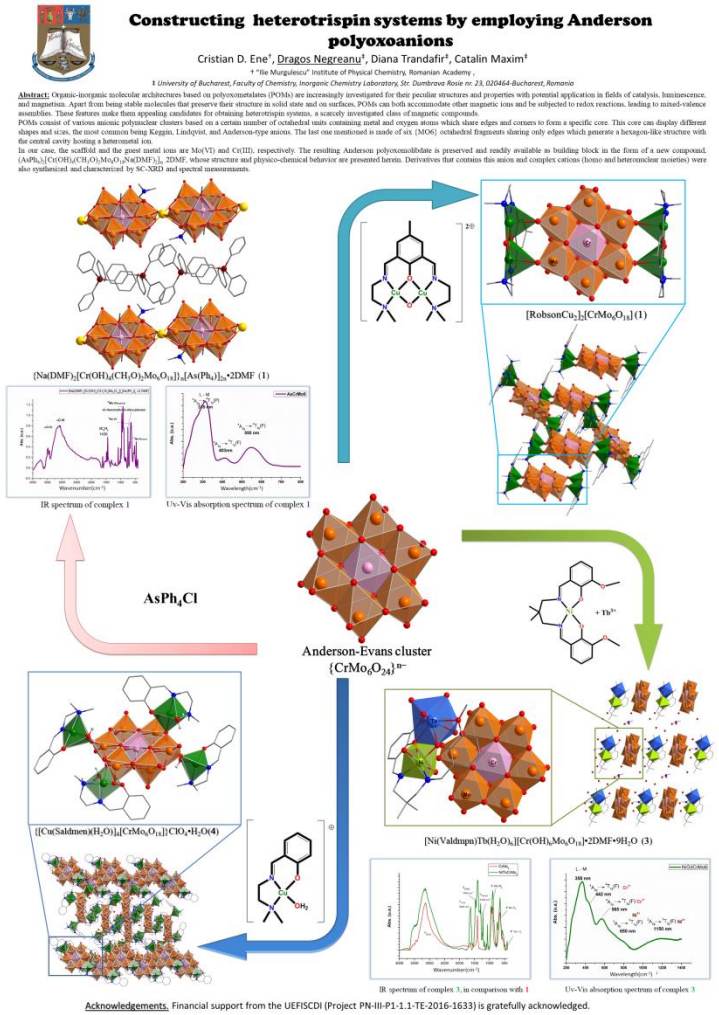
Paper: (**2019**) Chirality, 31 (9), pp. 621-627



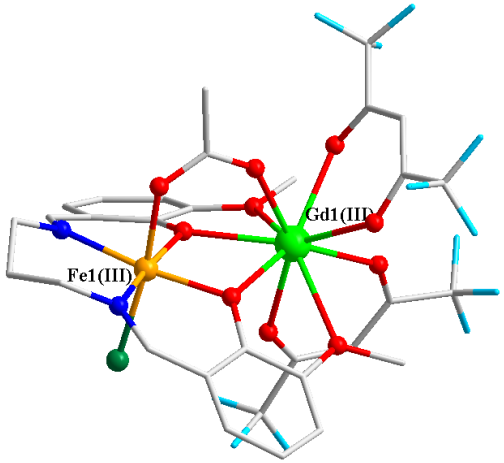


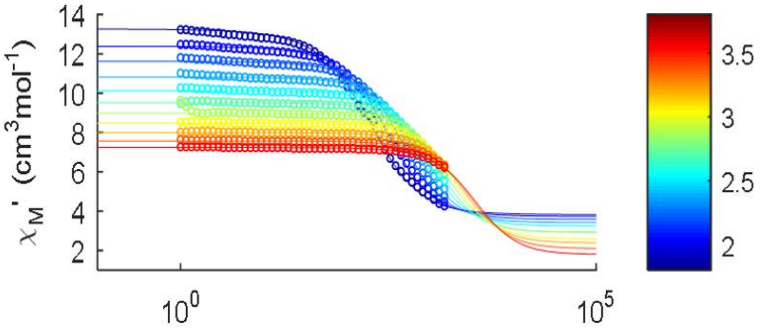
Transmission electron microscopy in life sciences
Theoretical and practical course -November 2019

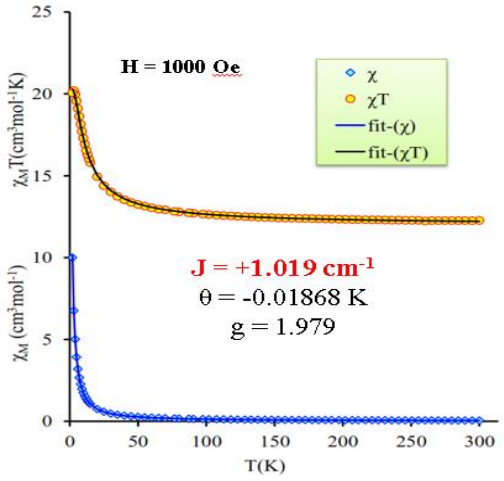
Catalin Maxim
Cristian Dumitru Ene



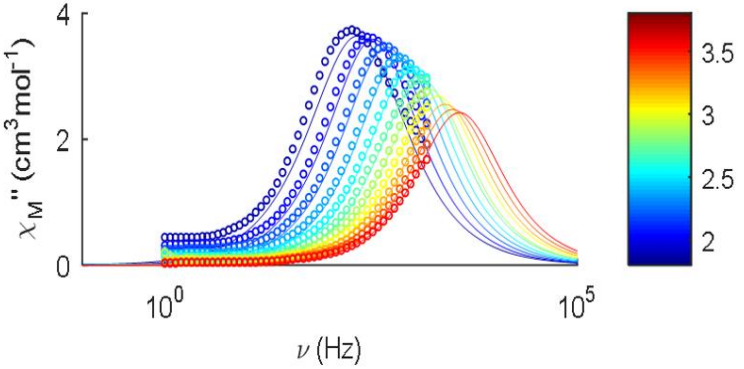
POMtriSpin







FeDy



Dissemination of results 2020:

Paper: (**2020**) One-dimensional coordination polymers constructed from copper(II) ions and chromato bridges: Synthesis, crystal structures and thermal analysis
Inorganica Chimica Acta 509, 119663