Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name :	Bernot	Given names :	Kevin
Status (prof., assistant prof., …) :	Professor		
Laboratory :	ISCR-CSM	Website address :	https://www.insa-rennes.fr/iscr-csm.html
Institution :	INSA Rennes	Website address :	https://www.insa-rennes.fr/en.html

Scientific competence of the supervisor:

• Professor, 105 paper, h-index=39, citations > 5600
• Junior member of « Institut Universitaire de France ». Excellence membership awarded each year to 70 assistant professors under 40 years old across all fields of research (humanities, law, economics, experimental sciences,…)
• "Distinguished Junior Member" of the French Chemical Society (SCF); 2020-2024
• "Junior Award 2020 from the Coordination Chemistry Division" of the French Chemical Society (SCF)

Two major publications in the field proposed for the PhD :

1. Bernot, K.; Daiguebonne, C.; Calvez, G.; Suffren, Y.; Guillou, O. Acc. Chem. Res. 2021, 54, 427-440.
2. Houard, F.; Evrard, Q.; Calvez, G.; Suffren, Y.; Daiguebonne, C.; Guillou, O.; Gendron, F.; Le Guennic, B.; Guizouarn, T.; Dorcet, V.; Mannini, M.; Bernot, K. Angew. Chem.-Int. Ed. 2020, 59, 780-784

Website address of the personal page :	https://iscr-csm.insa-rennes.fr/kevinbernot/
Supervisor's email :	kevin.bernot@insa-rennes.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** IV-11

Title : Synthesis and physico-chemical study of coordination chemistry molecules for multifonctionnal materials

Subject :

The association of metallic ions and organic ligands through coordination chemistry techniques is a very efficient route to design multidimensional edifices. The organic ligands can acts as linkers and organizers of the metallic ions at a molecular level and can afford a rich variety of compounds with either zero, 1, 2 or 3 dimensional architectures. Our group develops an intense activity in this area in order to afford tri-dimensional metal-organic frameworks or isolated molecules. These compounds are multifunctional as they present both luminescent and magnetic properties. The aim of this PhD project is to construct new multifunctional molecular edifices. First, their synthesis will be deeply investigated using conventional or unconventional (hydrothermal or microwave synthesis, sonocrystallization,…) methods. Then, they will be characterized either structurally (powder and single crystal XRD) and thermally (TDXD, TGA/TDA). Finally, significant efforts will be made to undergo their fine physical characterization. Their luminescence properties (luminance, quantum yield, life time…) will be deeply investigated, together with their magnetic properties. Special efforts will be made to investigate their magnetic slow relaxation and to characterize their possible single-molecule magnet properties (dc and ac magnetometry)

Keywords :

Coordination Chemistry, Metallic ions, Multifunctional Materials, Intelligent materials, Luminescence, Molecular Magnetism.

Expected collaborations :

Collaboration within the various reasearch groups from INSA Rennes

Background required from the applicant :

Chemical synthesis, powder X-ray diffraction, standard analyical methods (IR, UV-Vis…), standard thermal analysis methods (TGA/TDA). Background in inorganic chemistry and coordination chemistry,

Existence of a PDF file detailing the proposal ("yes" or "no") : no

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