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 :	SUFFREN	Given names :	Yan
Status (prof., assistant prof., …) :	assistant professor		
Laboratory :	ISCR/CSM-INSA	Website address :	https://www.insa-rennes.fr/iscr.html
Institution :	INSA Rennes	Website address :	https://www.insa-rennes.fr/

Scientific competence of the supervisor:

Crystalline engineering, crystal growth, inorganic synthesis (ligand, coordination polymers, complexes), coordination chemistry, X-ray single and powder diffraction, thermal analyzes, scanning electron microscopy (EDX), infrared and Raman spectroscopies, UV-absorption, steady-state and time-resolved luminescence spectroscopy, Luminescence at variable temperature and/or variable pressure.

Two major publications in the field proposed for the PhD :

1. Y. Pointel, C. Daiguebonne, Y. Suffren, F. Natur, F. L., S. Freslon, G. Calvez, K. Bernot, D. Jacob, O. Guillou, Inorg. Chem. Frontiers 2021, 8, 2125-2135
2. Y. Pointel, Y. Suffren, C. Daiguebonne, F. Le Natur, S. Freslon, G. Calvez, K. Bernot, O. Guillou, Inorg. Chem. 2020, 59, 10673-10687

Website address of the personal page : https://iscr-csm.insa-rennes.fr/yansuffren/

Supervisor's email : Yan.Suffren@insa-rennes.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** IV-5

Title : Synthesis, structural and spectroscopic characterizations and optimization of coordination polymers based on halogeno-carboxylic acids

Subject :

This research project at the INSA Rennes focuses on the synthesis and characterization of novel homo and hetero-metallic coordination polymers. X-ray diffraction, TGA and scanning electron microscopy (EDS) analyzes allow to obtain the structure, the stability, the morphology and the composition of the new obtained phases. These polymers may exhibit porous, magnetic properties and especially interesting and modular photo-physical properties. These photo-physical properties are studied by luminescence spectroscopy (emission spectra, excitation spectra, lifetimes and quantum yields), luminance and colorimetry measurements. The polycarboxylate family exhibits a remarkable affinity with metallic ions, thus generating a significant antenna effect and energy transfers between the ligand(s) and the emitting center(s).The main objective of this project is to make a fine analysis and qualitative comparison of the various halogeno-carboxylic ligands and metallic-based coordination polymers in order to identify the best candidates and to have a higher understanding of the photo-physical mechanisms governing the luminescence properties. For this, a multi-disciplinary approach (chemical, physical and theoretical using DFT method) will be used to study the halogeno-carboxylic ligands and the coordination polymers.

Keywords :

Crystal structures / Thermal analyzes / Luminescence / photophysical mecanisms

Expected collaborations :

ISCR/CTI (Université de Rennes 1)
FOTON-OHM (INSA Rennes)

Background required from the applicant :

coordination chemistry, inorganic synthesis, material characterizations

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

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