



université
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Dates of the internship: April-July 2024 (min 4 months)

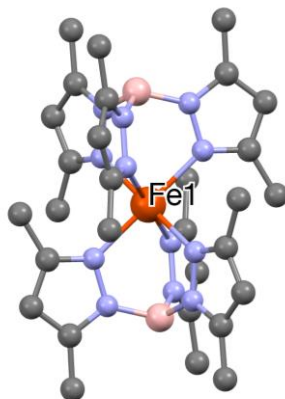
Spin crossover complexes for molecular electronics

Key words: molecular magnetism, coordination chemistry, molecular-based devices

Spin crossover complexes based on Fe(II) are known to undergo a spin crossover (change of the spin state) upon the application of external stimuli such as temperature, electrical field or light. The change of the spin state can also be read out by light performing the electronic or the infra-red spectra as a function of temperature.

This subject is part of a project including chemists and physicists that aim at preparing new molecules with targeted spin crossover behavior, then assembling them on substrates to build devices that are pertinent for molecular electronics.

The objective of the internship is to prepare new spin crossover complexes based on Fe(II) that are air resistant and possess a large thermodynamic stability with a transition near room temperature. The student will perform the organic synthesis of the ligands and the preparation of the complexes that belong to the tris-pyrazol family. The complexes will be characterized by electronic spectroscopy and by magnetic measurements. The molecules will then be sublimed to form a single layer on Au(111), Cu(100) and graphene and their properties investigated by X-ray Absorption Spectroscopy at the Soleil Synchrotron.



Example of the targeted Fe(II) coordination complexes showing spin crossover behavior