SPIN RELAXATION OF FERROCENIUM

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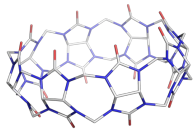
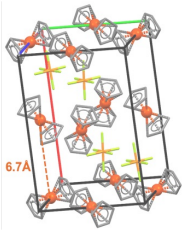
INTRODUCTION

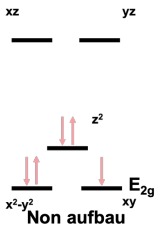
Ferrocenium shows considerable magnetic anisotropy. However, it exhibits fast magnetic relaxation promoted by dipolar interactions.

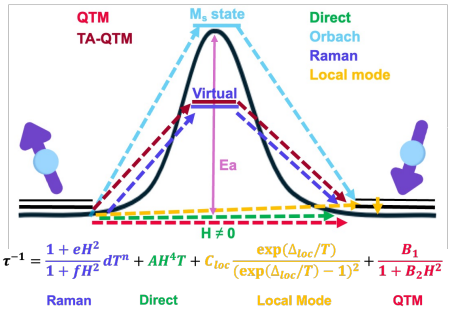
How to avoid it?

Encapsulation in a cucurbit[7]uril (CB7).

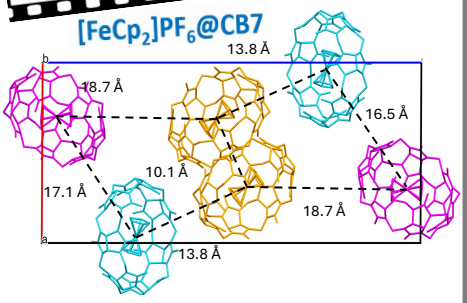


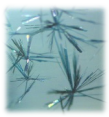






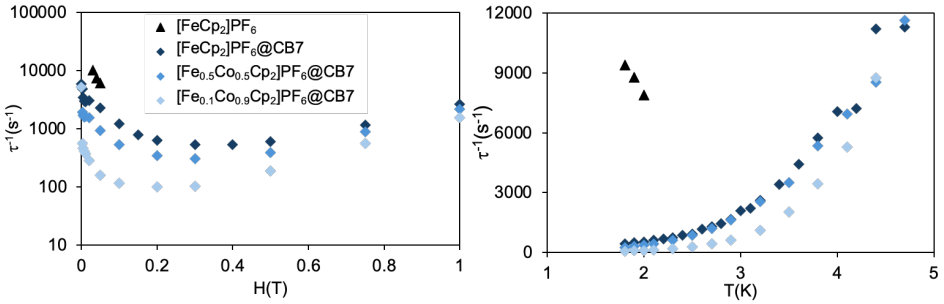
STRUCTURE





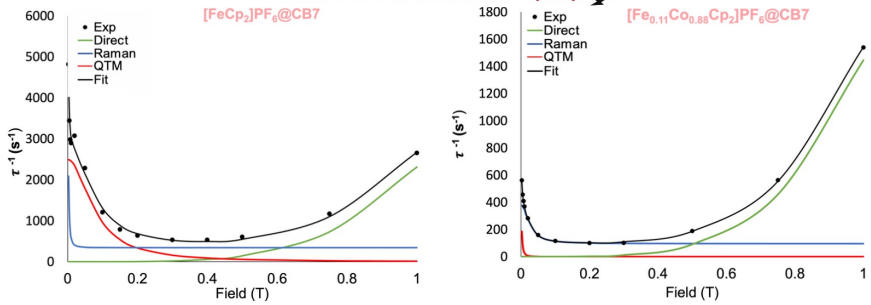
$[Fe_xCo_{1-x}Cp_2]PF_6$@CB7

SQUID MEASUREMENTS



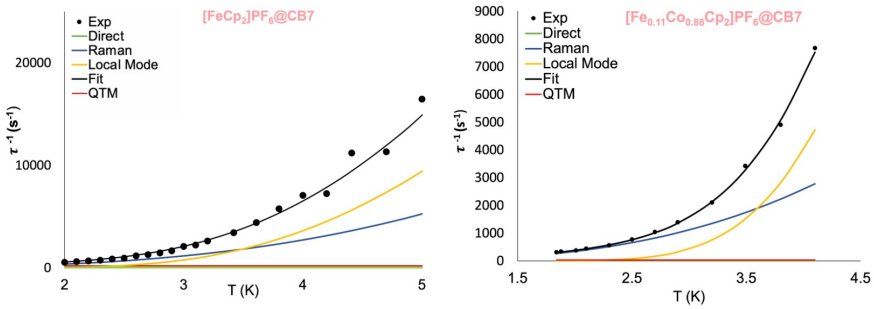
With the encapsulation and the magnetic dilution, the **dipole interactions decrease** and consequently the **relaxation time increases**, favouring other relaxation mechanisms instead of QTM.

FIELD DEPENDENCE (2K)



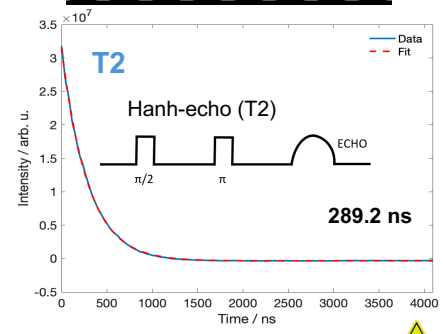
The spin relaxation mechanisms studied by analyzing the **depedence with the field:**
At low fields QTM term is the predominant, however if the system is magnetically diluted the Raman is the one that governs the relaxation.
The intermediate regions are governed by Raman and at high fields is controlled by Direct term in both systems.

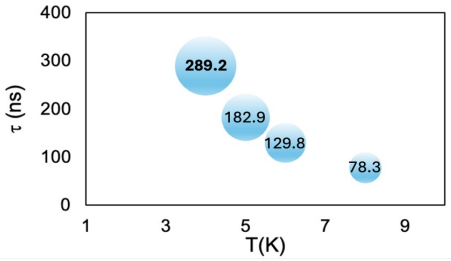
TEMPERATURE DEPENDENCE

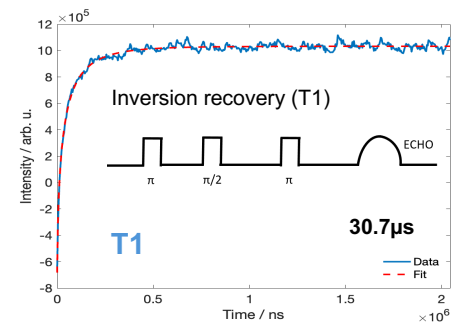


The spin relaxation mechanism studied by analyzing the **dependence with the temperature** where the predominant term is Raman at low temperatures and at high temperatures is governed by Local Mode.

EPR MEASUREMENTS







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[2] E. Moreno-Pineda, D. O.T.A. Martins and F. Tuna. Electron Paramag. Reson., 2021, 27, 146-187.
[3] S. G. McAdams, A.M. Ariciu, A.K. Kostopoulos, J. P. S. Walsh and F. Tuna. Coord. Chem. Rev.,2017, 346, 216-239.