

Workshop

MAGNETIC AND MÖSSBAUER SPECTROSCOPY STUDIES IN FE-CYCLAM - OXALATE LIGAND COMPLEX

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New iron(III) complex of formula $[\text{Fe}(\text{cyclam})\text{ox}]\text{PF}_6$ has been synthesized and characterized by spectroscopic (Mössbauer, IR, Raman), magnetic susceptibility (M-T) and magnetization measurements (M-H). The presence of two asymmetric stretchings (O-C-O) at 1705 and 1608 in IR spectra, corroborated by Raman result, indicates that oxalate ion is coordinated as a bidentate ligand. The UV-Vis spectrum in aqueous solution showed a cyclam-centered band at 230 nm along with two ligand-to-metal-charge-transfer (LMCT) transition bands at 293 and 357 nm. Interestingly, this compound shows reversible thermochromic features, changing color from yellow (300 K) to red when immersed in liquid nitrogen. This thermochromism behavior is due to a spin crossover process from the high spin species, $S = 5/2$, to the low spin state ($S = 1/2$). Mössbauer spectra at 300 K shows a doublet (D1) with $IS = 0.30$ mm/s and $QS = 0.40$ mm/s, consistent to high spin Fe^{3+} . These features changed when submitted to low temperatures, where the intensity of D1 is gradually decreased while a second doublet (D2) arises ($IS = 0.19$ mm/s and $QS = 1.73$ mm/s) consistent with a low spin species. Nonetheless, magnetic susceptibility curve has further indicated the occurrence of gradual and incomplete spin crossover (SCO) event with $T_{1/2} = 74.6$ K.

Data do Evento: 30 de outubro 2018

Horário: 16h00

Local : Sala de aula do PPCEM – Bloco Multimídia (2º andar)

Centro de Tecnologia - UFPB

Realização:



Apoio:

