chemisch
physikalische
gesellschaft

Gegründet im Jahre 1869 von H. Hlasiwetz,
J. Loschmidt, J. Petzval und J. Stefan

EINLADUNG

zum Vortrag von

Prof. Dr. Roman Boča

Professor of Inorganic Chemistry, Slovak University of Technology, Bratislava

über

Multistep Spin Transition in Polynuclear Iron Complexes

am

Dienstag, 13. März 2007, um 17.30 Uhr

Ort: Großer Hörsaal der Experimentalphysik, Universität Wien,
1090 Wien, Strudlhofgasse 4 / Boltzmanngasse 5, 1. Stock

Abstract:

The passage from **low**-spin (S = 0) to **high**-spin (S = 2) Fe(II) mononuclear complexes has been monitored by several experimental techniques: magnetic susceptibility, Mössbauer and far-Infra-Red spectroscopy, synchrotron powder diffraction and EFAFS, as well as DSC calorimetry (each temperature-dependent). These complexes serve as examples of multifunctional inorganic materials assembled from coordination compounds: they change volume, magnetic moment, colour, and metal-ligand distances on thermal propagation. Special attention is paid to the system with considerable solid-state cooperativeness leading finally to the appearance of the thermal hysteresis (the memory effect).

Binuclear Fe(III) complexes show similar effect, and in addition to traditional Fe(III)-Fe(III) pairs there are examples of Fe(III)-Fe(II) pair and $Fe(III)_L$-$Fe(III)_H$ pair. In the role of the blocking ligand a pentadentate Schiff-base L_5 has been used and the bridge (nature and its size) has also been varied. In these cases the spin transition can proceed in two steps: LL $\rightarrow$ LH $\rightarrow$ HH. In some cases the color change on heating is confirmed. Does it mean that such principle could be exploited for replacement of the binary recording mode (0 = L, 1 = H) to much more-efficient ternary one (0 = LL, 1 = LH, 2 = HH)? Or even to a quartery mode for trinuclear systems, like prepared and investigated $[\{L^5Fe^{III}(NC)\}_3Cr^{III}(CN)_3]$?

At the top of this molecular architecture lies a heptanuclear mixed-valence $[\{L^5Fe^{III}(NC)\}_6Fe^{II}]Cl_2$ complex showing the spin crossover. The spin transition, in principle could proceed in six steps.

CHEMISCH-PHYSIKALISCHE GESELLSCHAFT
c/o Ao.Univ.Prof. Dr. Georg Reischl, Sekretär, Universität Wien, Fakultät für Physik, 1090 Wien, Boltzmanngasse 5
Tel.: +43-(0)1-4277/51108, 51153 - Fax: +43-(0)1-4277 9511 - Email: Christl.Langstadlinger@univie.ac.at -
http://www.cpg.univie.ac.at
Vorsitzender 2006/07: Ao.Univ.Prof. Dr. Wolfgang Linert, Institut für Angewandte Synthesechemie, Techn.Univ. Wien