Long-lived metastable states in transition metal compounds

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Octahedral coordination compounds of transition metal ions having a $d^4 - d^7$ electronic configuration are well-known for the phenomenon of spin-crossover. For iron(II) complexes the transition occurs between the low-spin state with total spin quantum number $S = 0$ to the high-spin state with $S = 2$. It can be induced thermally, by applying pressure or by irradiation with light of appropriate wavelengths [1]. Since its discovery some 18 years ago, the light-induced spin transition has formed the basis for an increasingly large number of research projects worldwide. The lecture will begin with an introduction into the basic phenomena associated with spin-crossover, in particular with regard to the photophysical properties and the ensuing relaxation processes in spin-crossover compounds. The importance of cooperative effects in the solid state leading to hysteresis behaviour in the thermal spin transition, non-exponential relaxation curves and light-induced bistability, will be discussed [2].


