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Effect of pressure on the Spin-Crossover-Like Phenomenon in $Cu(hfac)_2$-Nitroxides Complexes

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Heterospin systems based on copper(II) complexes with nitroxyl radicals are of particular interest for detailed studies of various structural phase transitions that induce magnetic anomalies. During structural rearrangements the elongated Jahn-Teller axis in Cu(II) coordination units flips, that caused by significant changes in the energy of exchange coupling between the odd electrons of Cu(II) and nitroxide groups and provokes magnetic anomalies in the $\mu_{eff}(T)$ dependences which are similar to the classical spin transitions. Unique combination of physical properties steadily induces new active investigation of different aspects of this effect.

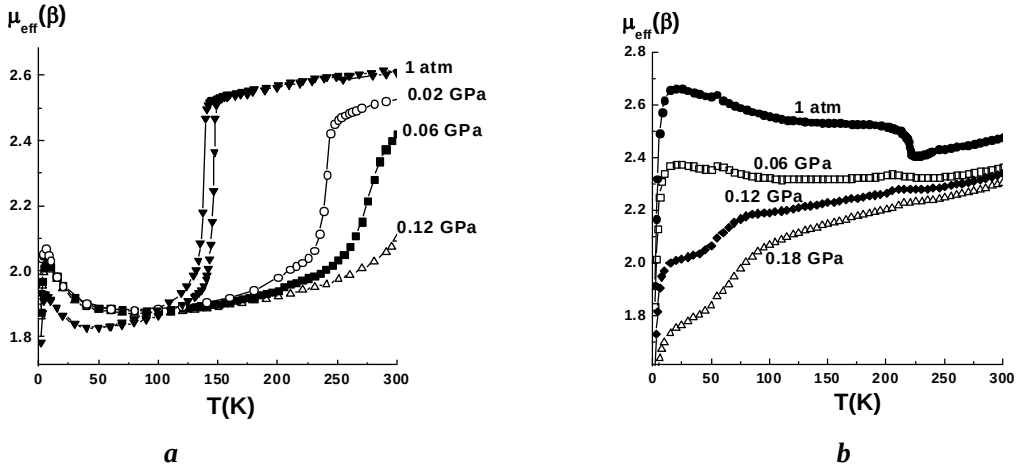

Fig. 1. μ_{eff} versus T plots at different pressures of $Cu(hfac)_2NN\text{-}Pz^{Me}$ (*a*) and $Cu(hfac)_2NN\text{-}Pz^{Et}$ (*b*).

Here we report the first results of our experiments of magnetic measurements under a hydrostatic pressure for chain-polymer complexes $Cu(hfac)_2NN\text{-}Pz^{R}$ (R=Me, Et) exhibiting magnetic anomalies. It was shown that a spin-crossover-like phenomenon in copper-nitroxide complexes is extremely sensitive to pressure: the most considerable changes of magnetic properties take place in pressure interval 10^{-4}-0.20 GPa. It was shown that the form of $\mu_{eff}(T)$ curve becomes more gradual and the temperature of magnetic anomaly is shifted towards higher temperatures with increasing pressure in solid of $Cu(hfac)_2NN\text{-}Pz^{Me}$. Increasing pressure substantially suppresses magnetic anomaly and changes the form of $\mu_{eff}(T)$ dependence in case of $Cu(hfac)_2NN\text{-}Pz^{Et}$.