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Static and dynamic magnetic properties of the ferromagnetic quasi 1D Ising system $[\text{Co}(\text{NCS})_2\text{pyridine}_2]_n$

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$[\text{Co}(\text{NCS})_2\text{py}_2]_n$ (py –pyridine) is composed of irregular ferromagnetic chains of Co(II) ions linked by the double NCS bridges. The coordination polyhedron of the Co(II) ion is a distorted octahedron built from equatorial two N and two S and two apical N atoms of the pyridine ligands. There are two inequivalent Co(II) ions which are magnetically coupled along chains in the $J_1J_1J_2$ sequence and the pyridine rings show an orientation disorder. Specific heat and magnetic study showed that $[\text{Co}(\text{NCS})_2\text{py}_2]_n$ undergoes a phase transition to the ferromagnetic state at the Curie point of 3.7 K. Magnetic interactions have been determined on the base of the Ising model. By means of AC magnetic susceptibility measurements the magnetic relaxations were investigated. Using High Field-High Frequency ESR (HF-ESR) method the magnetic excitations were observed and explained in the frame of the Ising model in full accordance with magnetic studies. Energy barriers for magnetization reversal obtained from magnetic and HF-ESR measurements are compared and discussed.

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