Magnetic characterization of binuclear nickel complex: special role of non-covalent intermolecular interactions

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A new nickel(II) dimeric complex $[Ni_2(HL)_2(py)_6(ClO_4)_2]_n$ (**I**) (H_2L = 2,6-bis(hydroxyimino)cyclohexanone; py = pyridine) have been characterized by variable temperature EPR and magnetic studies. Upon cooling the magnetic structure of (**I**) changes from the paramagnetic state at room temperature through the formation of the antiferromagnetic dimers at $\sim$ 65 K to the appearance of a spontaneous long range magnetic order at T $<\sim$ 20 K. Such behaviour can be explained taking into account the crystal structure of (**I**), which is assembled into supramolecular architectures by means of intermolecular non-covalent forces. Ours studies show that the coexistence and interplay between intradimer and interdimer (propagated by the hydrogen and π-stacking bonds) magnetic interactions as well as long range dipolar interactions gives rise to the magnetically ordered state at very low temperatures.

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