Crystal Structure and Magnetic Properties of a Dinuclear Iron(III) Doubly Oxygen Bridged Schiff Base Complex

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$[Fe(L)Cl]_2$ (L = N-(4-methylphenyl)-3-methoxy-salicylaldimimine) was synthesized and its crystal structure determined. $[C_{30}H_{26}Cl_2Fe_2N_2O_6]$, triclinic, space group $P\,\bar{1}$, a = 9.278(2), b = 9.4050(10), c = 10.489(2) Å, α = 64.43(2), β = 74.540(10), γ = 62.40(2)° , V = 729.1(2) Å^3, Z = 1. Two identical [Fe(L)Cl] fragments, related by an inversion center, are connected by two bridging O atoms to form a binuclear unit. The iron(III) centers are separated by 3.196(2) Å and weakly antiferromagnetically coupled (J = −10.1(1) cm^{-1}), as derived from temperature-dependent magnetic susceptibility measurements in the range 5.1–283.5 K.

Key words: Dinuclear Iron(III) Complex, Super-Exchange Interactions, Antiferromagnetic Coupling