Transition Metal Hydroxy-Terephthalates: Structure-Magnetism Relationship

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The title compounds belong to the family of hybrid lamellar materials were transition metal ions form layers spaced by organic anions. Metal hydroxy-terephthalates $M_x(OH)_{2x-2}(tp)$ ($tp = C_8H_4O_4$, M = Zn, Mn, Fe, Co, Ni, Cu) have been synthesized by hydrothermal route and their crystallographic structures were determined. Zn₃(OH)₄(tp) has been characterized from X-ray single crystal diffraction data: C2/c, a=28.100Å, b=6.310Å, c=14.836Å, $\beta=121.56^\circ$. The zinc atoms exhibit tetrahedral, octahedral and bi pyramidal coordinations, forming step-like layers bridged by terephthalate moieties. As for the paramagnetic ions, the layered structures of the model compounds Co₂(OH)₂(tp) (C2/m, a=19.943Å, b=3.289Å, c=6.289Å, $\beta=95.75^\circ$) [1] and Cu₂(OH)₂(tp) (P-1, a=10.143Å, b=6.339Å, c=3.484Å, $\alpha=99.17^\circ$, $\beta=95.75^\circ$, $\gamma=98.76^\circ$)[2] were determined *ab-initio* from XRPD data. The metallic cations lie in oxygen octahedra. Despite similar structures, different magnetic behaviors are observed depending on the metal ion and on symmetry differences. Low-temperature ferromagnetic-like ordering will be discussed on the basis of the structural features.

[1] Huang Z.L., Drillon M., Masciocchi N., Sironi A., Zhao J.-T., Rabu P., Panissod P., *Chem. Mater.*, 2000, **12**, 2805. [2] Abdelouhab S., François M., Elkaim E., Rabu P., *Solid State Sciences, in press.*

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