

## Dual-function Molecular Crystal with $[\text{Fe}^{\text{III}}(\text{C}_2\text{O}_4)\text{Cl}_2]^-$ Chain Anion

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Looking for new dual-functional molecular crystal is a emergency task to molecular electronics. Two-dimensional honeycomb  $\text{Cr}^{\text{III}}\text{Mn}^{\text{II}}(\text{C}_2\text{O}_4)^{3-}$  anion as a building block succeeded on built up ferromagnetic conductors, so as zero-dimensional  $\text{FeCl}_4^-$  anion to field-induced-organic superconductor with  $\pi$ -d interaction between donor and anion. It will be interesting to explore uniform one-dimensional anion with metal atom coordinated with  $(\text{C}_2\text{O}_4)^{2-}$  and  $\text{Cl}^-$ . Several novel salts with one-dimensional  $[\text{Fe}(\text{C}_2\text{O}_4)\text{Cl}_2]^-$  anion were synthesis, one iron atoms bonds to two Cl atoms and four oxygen atoms of two oxalato groups in cis-mode. Depending on the counter-cation from  $\text{A}^+$ ,  $\text{R}_4\text{N}^+$  and TTF series molecules, a uniform binding-arch or zigzag anion chain is found in the crystal. So dual-functional molecular crystal with magnetism property from paramagnetic, antiferromagnetic to ferromagnetic, conductivity from insulator, semiconductor, metal in charge-transfer complex and fast-ion conductor are constructed.

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