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# Dual-functional Molecular Crystals from Cu-oxalato Anion with the Jahn-Teller Distortion

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The Jahn-Teller effect plays a key role to ceramic material from superconductivity to giant-magnetic-resistance. Organic-inorganic hybrids containing the 0D, 1D, 2D, and 3D Cu-oxalato anion with the Jahn-Teller distortion were obtained. They are dual-functional molecular crystal with magnetism from paramagnetic, antiferromagnetic, to ferromagnetic, conductivity from dielectric, protonic, to electronic. The dielectric property was influenced by the Jahn-Teller distortion of Cu-oxalato anion. The proton conductivity from hydrogen-bond between H<sub>2</sub>O and Cu-oxalato anion could be modulated by humidity of environment. The electronic conductivity could be modulated by changing the organic donor and configuration of Cu-oxalato anion. These materials are useful for research on molecular spintronics and protonics.

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