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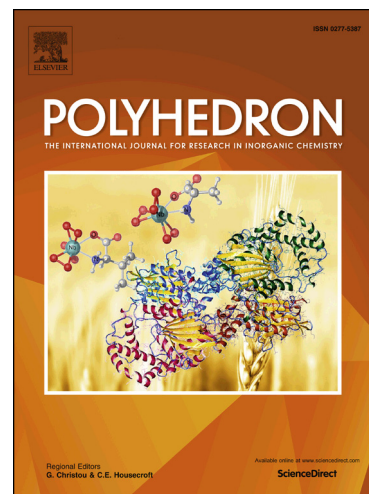
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3D Oxalate-Based Coordination Polymers: Relationship between Structure, Magnetism and Color, studied by High-Field ESR Spectroscopy[☆]

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Abstract

The detailed high field electron spin resonance (HF-ESR) study of three 3D oxalate-based coordination polymers with antiferromagnetic ordering below 13 K, supported by crystallographic, photoluminescence (PL), elemental (EDX) and X-band ESR analysis, is presented. Two of the investigated compounds are described by the same chemical formula $\{[\text{Cu}(\text{bpy})_3][\text{Mn}_2(\text{C}_2\text{O}_4)_3]\cdot\text{H}_2\text{O}\}_n$, both exhibit PL but have different colors: green-blue and red-pink (CuMn2-Green and CuMn2-Red, respectively) while $\{[\text{Co}(\text{bpy})_3][\text{Mn}_2(\text{C}_2\text{O}_4)_3]\cdot\text{H}_2\text{O}\}_n$ is yellow (CoMn2-Yellow) without PL. Despite different colors of CuMn2-Green and CuMn2-Red, X-ray diffraction, EDX, as well as X-band ESR, could not reveal any difference between these compounds. Therefore, detailed temperature dependent multifrequency HF-ESR experiments were performed. Owing to very high resolution of HF-ESR, two different Mn(II) centers in CuMn2-Green and CoMn2-Yellow compounds could be resolved, while in CuMn2-Red only one

[☆]Electronic Supplementary Information (ESI) available: [CIF file and crystallographic data of CuMn2-Red; SEM pictures, EDX spectra and Mn:Cu EDX ratios for CuMn2-Green and CuMn2-Red; PL spectra of CuMn2-Green, CuMn2-Red and CoMn2-Yellow; X-band ESR study with CuMn2-Red and CoMn2-Yellow spectra and simulation for CoMn2-Yellow. CCDC 1504116]. For ESI and crystallographic data in CIF or other electronic format see DOI.....

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