

Magnetic and spectroscopy properties of two different families of coordination polymers containing Lanthanides and 3-HCCA ligand

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Coordination polymers are a type of material that is of major interest due to their many different applications, ranging from magnetism, luminescence, gas adsorption, catalysis, and many others [1]. Lanthanide ions have unique magnetic and spectroscopy properties due to their 4fⁿ distribution, which are shielded from the full 5s² and 5p⁶ and resulting in a characteristic close to the predicted from free ion [2]. Herein, we present magnetic and luminescent properties for two different families of coordination polymers containing Ln (Eu, Gd, Tb, and Dy) alongside Coumarin-3-carboxylic acid (3-HCCA) (Fig. 1), where compounds differ in the number of organic ligands which are coordinated. For both families, the complexes containing Europium for both families exhibit luminescence with different lifetimes (0.45 ± 0.05 ms and 0.30 ± 0.05 ms), suggesting different mechanism of energy transfer by antenna effect. Magnetic susceptibility and magnetocaloric studies were performed on these compounds and the preliminary results indicate slow magnetic relaxation in the Tb and Dy compounds.

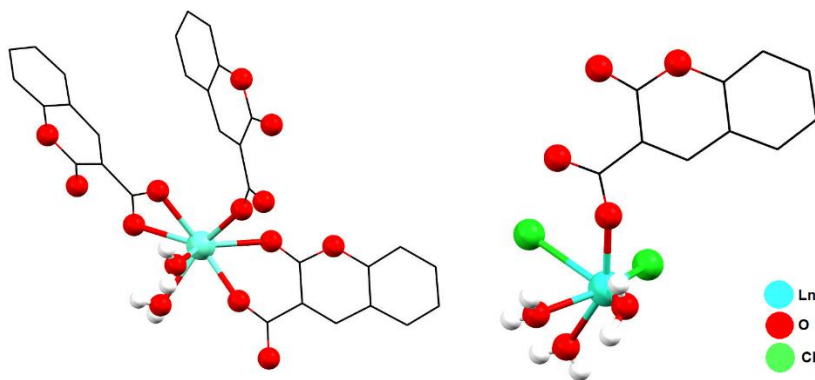


Figure 1: Asymmetric unit of both coordination polymers families $\{[\text{Ln}(\text{3-HCCA})_3(\text{H}_2\text{O})_2\text{H}_2\text{O}]_n\}$ and $\{[\text{Ln}(\text{Cl})_2(\text{3-HCCA})(\text{H}_2\text{O})_3]\text{H}_2\text{O}\}$

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References

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