

Photoluminescence properties of helicate lanthanide complexes

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The narrow band shapes and relative long lifetime with high quantum yields in the trivalent-lanthanide luminescence will apply for the devices or sensors. However, the modification of the complexes are still difficult based on the molecular design because of their own nature of f-electrons. Here, we will introduce the luminescence properties of a series of lanthanide (Ln = Eu, Tb, Gd, Ho, Nd and Dy) complexes with a hexadentate organic ligand, **L**, which directly wraps a metal ion as shown in Figure 1. These complexes form a helicate structure and two nitrate anions coordinate to the center metal from apical site. The formation is quite stable even in solution, then the luminescence properties are kept in any atmospheres in rt, even in ionic liquid. From the both experimental and theoretical viewpoints, the advantage of luminescence in helicate lanthanide complexes will be discussed.

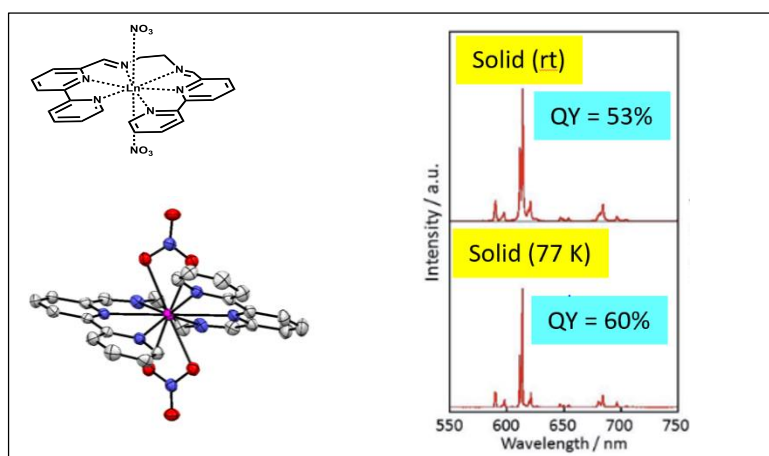


Figure 1. Molecular structure (top: chemical structure, bottom: ORTEP drawing; gray = C, red = O, blue = N and pink = Eu, counter anion PF₆ and hydrogen atoms are omitted for clarity.) of LnL and luminescence spectra of EuL ($\lambda_{\text{ex}}=315$ nm).

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References:

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