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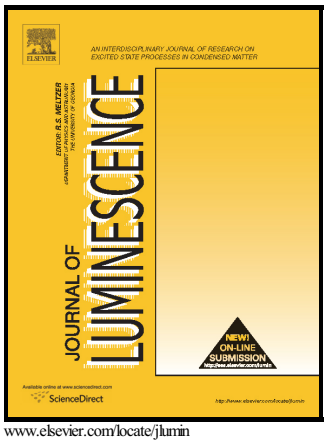

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Exploring the effect of remote substituents and solution structure on the luminescence of three lanthanide complexes

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Keywords

Kinetically inert lanthanide complexes; lanthanide emission; sensitised emission; lanthanide solvation; solution structure;

Research Highlights

- Effects of remote substituents on the luminescence from kinetically inert lanthanide complexes
- Molecular structure rather than chromophore density determines outcome of lanthanide sensitization
- Kimura's and Horrocks' approach to determine lanthanide solvation is revisited
- Solvent can significantly change sensitization pathways in multinuclear lanthanide complexes
- Increasing chromophore density may reduce the amount of lanthanide luminescence observed

Abstract

Sensitized luminescence from trivalent lanthanide ions relies on an appropriate match of energy between the sensitizer's excited state (triplet or singlet) and the lanthanide excited state manifold and an efficient mechanism of energy transfer between the two. Here, the effect of remote substituents on the luminescence properties of a series of related lanthanide complexes has been investigated. The sensitized lanthanide centered emission is found not to occur following excitation of all chromophores in all systems, and it is shown that only the most structurally congested of the systems investigated exhibited pronounced solvatochromism.