The effect of excited state energy transfer on the circularly polarized luminescence from sol-gels containing racemic complexes of Eu(III): theory and experiment.

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Streszczenie

Excited state energy transfer between enantiomers in concentrated samples will diminish the differential excited state concentrations of a photoenriched racemic mixture, and this phenomenon will be reflected in a decrease in the observed circularly polarized luminescence as compared to low concentration samples where this energy transfer process can be neglected. Such a decrease is reported here for complexes of Eu(III) with 2,6-pyridine-dicarboxylate and 2,2‘-bipyridine-*N*,*N*‘-dioxide = bpyO_2 ligands. This work represents the first experimental observation of this phenomenon for samples prepared in high concentration by incorporation into high-quality strain-free sol−gels. These results are fit to a theoretical model appropriate for randomly oriented and dispersed solute chromophores, and the Förster critical transfer distance is obtained. Limitations of the model and other experimental difficulties are described.

Słowa kluczowe

Energy transfer, Excited states, Luminescence, Molecular structure, polarization

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