The role played by structural and energy parameters of β-Diketones derivatives as antenna ligands in Eu(III) complexes

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Abstract
Structural and energy parameters role of six β-diketone antennas (symmetry, bulkiness, quenching bonds, donor groups and coordination) were analyzed. Six β-diketone derivatives and its complexes Eu(Phen)$(X)_3$ and Gd(Phen)$(X)_3$(X = β-diketone), were synthetized, characterized, experimentally studied through photophysical characterization. To analyze the contribution of each antenna to the photophysical properties, TD-DFT calculations were performed. To elucidate the antennas/Eu(III) energy levels involved in the energy transfer process CASSCF calculations were performed. Two antenna ligands effectively feed the europium center. A ligand without symmetry, with donor groups, without quenching bonds, and capable to fulfill the energy requirements, is the best antenna ligand for these complexes.

Author keywords
Antenna effect
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