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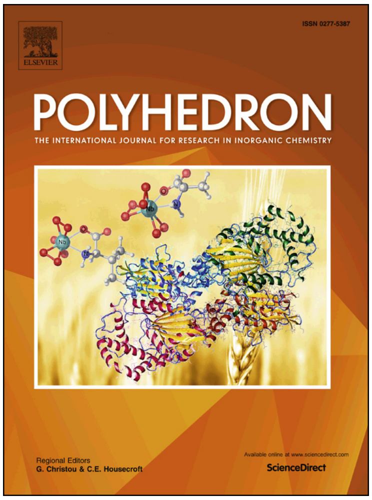

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D→f energy transfer in heteronuclear Ir(III)/Ln(III) near-infrared luminescent complexes

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Abstract

A series of d/f dinuclear complexes **Ir•Ln** [where Ln = Eu(III), Gd(III), Yb(III) and Nd(III)] are reported. The core structure consists of a rigid skeleton containing two different types of receptor site in a single molecular motif designed to combine a transition metal ion [Ir(III)] and a lanthanide ion [Ln(III)] in different binding sites at either end of fully conjugated bridge to facilitate d→f energy-transfer following photoexcitation of the Ir(III)-based antenna unit. Steady state and time-resolved photophysical experiments on these compounds revealed that the energy-transfer is feasible only in case of **Ir•Yb** and **Ir•Nd** systems, affording sensitized emission from the Yb(III) or Nd(III) centres. Such EnT is not possible in the **Ir•Eu** dyad as the excited state energy of the Ir(III) unit is insufficient to sensitise the excited state of the Eu(III) centre.