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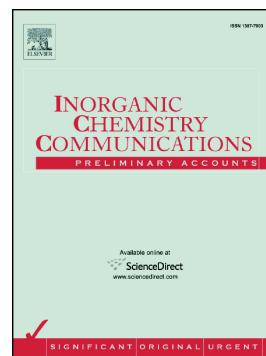
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**Crystal structure and temperature dependence of the photophysical properties of
the [Eu(tta)₃(pyphen)] complex.**

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Abstract

In this work, we synthesized the {tris(thenoyltrifluoroacetone)pyrazino[2,3-f][1,10]phenanthroline}europium(III) complex and studied its thermal emission quenching. The crystal structure of the [Eu(tta)₃(pyphen)] complex show that the europium(III) ion occupies a distorted D_{4d} symmetry of a square antiprism site. The complex shows an absolute emission quantum yield of 31%. The temperature dependence of the photophysical properties of the complex was evaluated and indicates that the complex has potential to be applied as a lifetime based luminescent thermometer. The quenching of the luminescence as a function of temperature occurs due the energy back-transfer from the emitter state to the ligand centered triplet state. The temperature induced blue-shift in the ⁵D₀ → ⁷F₀ transition band indicates the presence of the electron-phonon coupling in this complex.

Keywords: Europium(III) complex, Luminescent thermometer, Crystal structure, Electron-phonon coupling.

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