



# Organic light emitting diodes with europium (III) emissive layers based on $\beta$ -diketonate complexes: The influence of the central ligand

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## Abstract

This work shows a comparative study of organic light emitting diodes based on four different europium complexes with the general formula,  $\text{Eu}(\text{CLs})_3\text{bipyridine}$ , where the central ligands are DBM [tris(dibenzoylmethane)], TTA [tris(1-(2-thienyl)-4,4,4-trifluoro-1,3-butanedione)], NTA [tris(1-(2-naphthoyl)-3,3,3-trifluoroacetone)] and BTA [tris(1-(2-benzoyl)-3,3,3-trifluoroacetone)]. All devices have a driving voltage of 14–16 V, a very low electrical current at normal operation (less than 1 mA) and a good Wall Plug Efficiency (up to near  $10^{-3}\%$ ). The most suitable central ligand was found to be DBM, with an optical power up to 200 nW (at 612 nm). The BTA exhibits the lowest stability under high applied voltages. The other central ligands have similar results among them. The electroluminescence spectra clearly show the europium ion transitions (with a strong  $^5\text{D}_0 \rightarrow ^7\text{F}_2$  line) with a CIE color coordinate around (0.56, 0.34). © 2008 Elsevier B.V. All rights reserved.

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