# MASTER'S THESIS

## Organic light-emitting diodes employing charge transporting europium complexes and tandem architecture

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# Organic Light-emitting Diodes Employing Charge Transporting Europium Complexes and Tandem Architecture

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# Abstract

Organic light emitting diodes (OLEDs) received much attention in the past two decades. With the continuous efforts from researches, OLEDs have been commercialized in display applications. Although OLEDs products have been released, there are room for improvement in both device efficiency and operating lifetime. In this thesis, two directions in improving OLEDs efficiency will be studied. One focused on the novel emitting materials while the other one focused on the new devices architecture. For the emitting material, a series of europium complexes will be introduced. The optical and electrical properties of the Eu complexes will be examined. The quenching problem of the phosphorescent Eu complexes will also be improved. For the new devices architecture, stacked OLEDs will be introduced. The stacked OLED in this thesis consists of two standard OLEDs connected by a charge generating layer. $GeO_2$ will be evaluated to be a charge generating material. The stacked OLEDs performances will be examined and optimized. The charge generating mechanism will also be discussed.

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