# Improved OLED with tunable IV

***X. W. Sun***
School of Electrical & Electronic Engineering, Nanyang Technological University, Nanyang Avenue, Singapore 639798 and
Institute of Microelectronics, 11 Science Park Road, Singapore Science Park II, Singapore 117685

## Abstract

A hole-blocking layer (HBL), (BCP or $Alq_3$), was incorporated between the hole-transporting layer (HTL) and hole-injection layer for a tris-(8-hydroxyqunoline) aluminum-based organic light-emitting device. Such a structure helps to reduce the hole-leakage to the cathode resulting in improved current efficiency. A 30% improvement was observed compared to that of the standard device without HBL. Low operating voltage was also achieved by minimizing the thickness of the HTL. With BCP as HBL, a tunable I-V curve was observed. However, with $Alq_3$ as HBL, exciplex emission was observed. Based on the exciplex emission, we built upon traditional fluorescent materials to build a white OLED with reasonably good performance.