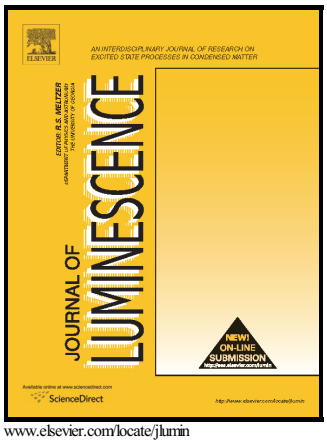

www.elsevier.com/locate/jlumin

Application of Exciplex in the Fabrication of White Organic Light Emitting Devices with Mixed Fluorescent and Phosphorescent Layers

Dan Yang, Yahui Duan, Qiangyong Yang, Nan Hu, Xiao Wang, Fengbo Sun, Yu Duan

PII: S0022-2313(15)00256-2
DOI: http://dx.doi.org/10.1016/j.jlumin.2015.05.009
Reference: LUMIN13340

To appear in: *Journal of Luminescence*

Received date: 14 July 2014
Revised date: 17 April 2015
Accepted date: 10 May 2015

Cite this article as: Dan Yang, Yahui Duan, Qiangyong Yang, Nan Hu, Xiao Wang, Fengbo Sun and Yu Duan, Application of Exciplex in the Fabrication of White Organic Light Emitting Devices with Mixed Fluorescent and Phosphorescent Layers, *Journal of Luminescence,* http://dx.doi.org/10.1016/j.jlumin.2015.05.009

Application of Exciplex in the Fabrication of White Organic Light Emitting Devices with Mixed Fluorescent and Phosphorescent Layers

Dan Yang[1)], Yahui Duan[1)], Qiangyong Yang[1)], Nan Hu[1)2)], Xiao Wang[1)], Fengbo Sun[1)2)], Yu Duan[1)*]

[1] State Key Laboratory on Integrated Optoelectronics, College of Electronic Science & Engineering, Jilin University, Changchun 130012, China

[2] Changchun University of Science and Technology, Changchun 130012, China

Abstract

In this study, a highly efficient fluorescent/phosphorescent white organic light-emitting device (WOLED) was fabricated using exciplex light emission. The hole-transport material 4,4',4"-tris(N-carbazolyl)triphenylamine (TCTA), and electron-transport material, 4,7-diphenyl-1,10-phenanthroline (Bphen), were mixed to afford a blue-emitting exciplex. The WOLED was fabricated with a yellow phosphorescent dye, Ir(III) bis(4-phenylthieno[3,2-c]pyridinato-N,$C^{2'}$) acetylacetonate (PO-01), combined with the exciplex. In this structure, the energy can be efficiently transferred from the blend layer to the yellow phosphorescent dye, thus improving the efficiency of the utilization of the triplet exciton. The maximum power efficiency of the WOLED was reached a value 9.03 lm/W with an external quantum efficiency of 4.3%. The Commission Internationale de I'Eclairage (CIE) color coordinates (x, y) of the device were (0.39, 0.45) to (0.27, 0.31), with a voltage range of 4V-9V.

Keywords: Exciplex, Blue-light emission, Phosphorescent, White-light emission