Synthesis, Characterization, Electrochemistry and Photo-property Study of 1,3,4-Oxadiazole-based Ortho-metalated Iridium(III) Complexes

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Due to the significant advantage of organic light-emitting diode (OLED) over traditional liquid crystal displays, its research and application have become a hot field in recent years. Heavy metal complex, especially the iridium(III) complex with cyclometalated ligand, has attracted much attention as a very promising phosphor dyes in OLEDs. This presentation will focus on synthesis, characterization, electrochemistry and photo-property of four new cyclometalated iridium(III) complexes. Compound structure was confirmed by several analytical techniques. Cyclic voltammetry was used to estimate energy levels of these synthesized metal complexes. Ancillary ligand with stronger ligand field strength stabilizes complex HOMO energy level, hence its emission spectrum shows hypsochromic shift comparing to complex with weaker ancillary ligand. Three OLED devices were fabricated with these newly synthesized iridium complexes, their electroluminescence property will also be discussed in this presentation.

Reference:

(1) Synthesis, structure, electrochemistry, photophysics and electroluminescence of 1,3,4-oxadiazole-based ortho-metalated iridium(III) complexes; Lianqing Chen, Chuluo Yang, Jingui Qin, Jia Gao, Han You and Dongge Ma; *Journal of Organometallic Chemistry*; 691 (2006) p3519-p3530

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(3) Introduction to Spectroscopy, Donald L. Pavia; Gary M. Lampman; George S. Kriz; second edition, Harcourt Brace College Publication

(4) Principles of Instrumental Analysis, Douglas A. Skoog; F. James Holler; Timothy A. Nieman; fifth edition, Harcourt Brace College Publication