Manipulating the Functional Properties of Phosphorescent Metal Complexes by Ligands Containing Main-Group Elements

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Owing to their unique electroluminescence (EL) ability of harnessing both singlet and triplet excitons, phosphorescent (triplet) emitters have brought revolutionary progress in the field of organic light-emitting diodes (OLEDs) by furnishing high EL efficiencies. It was shown that nonmetallic main-group elements can exhibit distinct electronic features. Moreover, the electronic character of these elements, such as P and S etc., can be altered easily by appropriate chemical modifications such as oxidation. Metallophosphors of platinum and iridium with various main-group elements provide a versatile approach towards color tuning and studying the evolution of the lowest singlet and triplet excited states of these materials. In this talk, the recent developments of a new series of iridium(IIII) and platinum(II) phosphors with the main-group elements in the ligands will be presented and their use in the full color OLED and WOLED applications will be highlighted. Other light-emitting applications of some of these transition metal complexes will also be discussed.

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