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研究论文

含三芳胺基的单环金属铂配合物的合成及其光物理与电化学性质

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摘要 通过Ullmann反应和环金属化反应合成了两种新型含三芳胺基的单环金属铂配合物: [N,N-二(4-叔丁基苯基)-4-(2'-吡啶基)苯胺-C3, N1](二苯甲酰基甲烷)合铂(Ⅱ)[(BuPhNPPy)Pt(DBM)]和[N,N-二苯基-4-(2'-吡啶基)苯胺-C3, N1](二苯甲酰基甲烷)合铂(Ⅱ) [(PhNPPy)Pt(DBM)], 探讨了分子结构和反应条件对合成反应的影响, 环金属化反应的产率达到87.0%. 研究了单环铂配合物的紫外-可见光谱、光致发光和电化学性质. 研究结果表明, (PhNPPy)Pt(DBM)和(BuPhNPPy)Pt(DBM)的氧化-还原电位分别为0.80, -1.63 V和0.93, -1.45 V; 它们都具有很强的紫外吸收和光致发光性能, 其中(PhNPPy)Pt(DBM)的最大紫外吸收峰为346 nm, 最大荧光波长为537 nm, (BuPhNPPy) Pt(DBM)的最大紫外吸收和荧光波长相应红移7~13 nm.

关键词 铂配合物 合成 紫外-可见光谱 光致发光 电化学性质

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Synthesis of Cyclometalated Platinum Complexes Containing Triarylamino Group and Their Photophysical and Electrochemical Properties

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Abstract Two cyclomatetaled platinum (Pt) complexes containing triarylamine moiety were synthesized by Ullmann and cyclometalated reactions, which are [N,N-(4-tert-butylphenyl)-4-(2'-pyridyl)aniline-C3, N1] (diphenoxylmethane) Pt(Ⅱ) [(BuPhNPPy)Pt(DBM)] and [N,N-diphenyl-4-(2'-pyridyl)aniline-C3, N1] (diphenoxylmethane) Pt(Ⅱ) [(PhNPPy)Pt(DBM)]. The influence of reaction condition and molecular structures on the synthesis was investigated. The cyclometalated yield was 87.0%. The spectral and electrochemical properties of these Pt complexes were also studied. The results showed that both complexes had intense UV-Vis absorption and photoluminescence properties. The oxidation and reduction potentials of (PhNPPy)Pt(DBM) and (BuPhNPPy)Pt(DBM) are 0.80, -1.63 V and 0.93, -1.45 V respectively. The maximum UV-Vis absorption and photoluminescence wavelengths of (PhNPPy)Pt(DBM) are 346 and 537 nm respectively and these of (BuPhNPPy)Pt(DBM) have a red-shifted wavelength of 7—13 nm.

Key words Pt complex Synthesis UV-Vis spectrum Photoluminescence Electrochemical property

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