

论文

含六苯基苯结构单元桨型分子的合成及光致发光特性

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摘要:

以1,3,5-三苯基苯为中心核, 4-乙烯基联苯为桥联结构, 通过Heck偶联反应合成了含六苯基苯结构单元的桨型分子, 对其结构进行了表征; 对桨型分子及其结构单元[包括4-乙烯基联苯、含六苯基苯结构的“臂”及其母体结构1,3,5-三(4-苯乙炔基苯基)苯]在溶液中的光致发光特性的研究表明, 桨型分子具有2个发光中心, 最大发射波长在蓝光范围内分别为397和445 nm.

关键词: 4-乙烯基联苯 六苯基苯 1,3,5-三(4-苯乙炔基苯基)苯 桨型分子 蓝色发光

Synthesis and Photoluminescent Properties of Propeller-shaped Polyphenylenes Containing Hexaphenylbenzene Units

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Abstract:

A novel propeller-shaped polyphenylene(9), based on hexaphenylbenzene-graphite subunits and a core molecule, 1,3,5-tris(4-styrylphenyl)benzene(8), was synthesized by Heck coupling reaction of 4-(4-vinylphenylene) hexaphenylbenzene(7) with 1,3,5-tris(4-iodophenylbenzene)(4). The structure of molecule 9 was characterized by FTIR, ¹H NMR, ¹³C NMR, GPC, MALDI-TOF mass spectrum, and elemental analysis. The absorption and photoluminescence spectra of propeller-shaped molecule 9 were investigated. Compared with structurally related chromophoric units including 4-vinylbiphenyl, 1-[4-(4-vinylphenyl)phenyl]-2,3,4,5,6-pentaphenylbenzene 7 and 1,3,5-tris(4-styrylphenyl)benzene 8, the absorption peak of molecule 9 was red-shifted to 355 nm. This molecule exhibited two maximum emitting peaks at 397 nm and 445 nm in the range of blue luminescence with photoluminescence efficiency being 19%.

Keywords: 4-Vinylbiphenyl Hexaphenylbenzene 1,3,5-Tris(4-styrylphenyl)benzene Propeller-shaped molecule Blue photoluminescence

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