

研究论文

纳米二氧化硅为核的树枝状分子中荧光素激基缔合物和基态复合物的形成

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摘要 在以二氧化硅为核的聚酰胺(PAMAM)树枝状聚合物的外端, 通过表面化学修饰引入了具有发射荧光能力的荧光素分子.

通过稳态荧光方法研究其固体和在水和丙酮的悬浮液中的光物理行为. 试验结果表明, 固体样品中, 在零代树枝状分子(G0F)中, 荧光发射主要是激基缔合物的发射, 在第一(G1F)和第二代(G2F)中只有基态复合物的发射. 在不同的悬浮液中不同的光物理行为表明, 树枝状分子中树枝链间的氢键作用的大小决定荧光素基团间是形成激基缔合物还是形成基态复合物. 这为设计和开发新型“壳-核”型纳米二氧化硅荧光传感器提供了有用的实验依据.

关键词 [荧光素](#) [纳米二氧化硅](#) [氢键](#) [激基缔合物](#) [基态复合物](#) [荧光传感器](#)

分类号

Excimer and Ground-state Complex Formation of Fluorescein in a Dendrimer Based on Silica Nanoparticles

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Abstract Polyamidoamine dendrimers based on silica nanoparticles have been prepared, then the fluorescein was bonded onto the surface of such dendrimers. The photophysical behavior of different generations was studied carefully by using fluorescence spectroscopy in solid state, aqueous suspension or acetone suspension. An excimer fluorescent emission was observed for the lowest generation (G0F), and fluorescein-fluorescein complex fluorescent emissions were observed for the first generation (G1F) and the second-generation (G2F). The different photophysical behaviors in various suspension indicated that the hydrogen-bonding interaction was crucial to form either excimer or fluorescein-fluorescein complex. These results will be important and beneficial for design and development of this system used as a core-shell fluorescent sensor of nanosilica.

Key words [fluorescein](#) [silica nanoparticle](#) [hydrogen bonding](#) [excimer](#) [ground-state complex](#) [fluorescent sensor](#)

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