

论文

一种基于胆固醇的荧光小分子胶凝剂的合成及其胶凝行为

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摘要:

合成并表征了一种含7-硝基苯并-2-氧杂-1,3-二唑基(7-Nitrobenzo-2-oxa-1,3-diazol-4-yl)的胆固醇衍生物(NBD-C), 考察了其在30种溶剂中的胶凝行为. 实验结果表明, NBD-C对乙腈具有很强的胶凝作用, 且该凝胶体系具有显著的剪切触变性. 对干凝胶的显微分析发现, 在不同溶剂中, NBD-C具有不同的聚集结构. 红外光谱(FTIR)、核磁共振光谱(^1H NMR)和荧光光谱研究结果表明, 除了胆固醇的范德华堆积作用之外, 分子间氢键作用也是该化合物聚集的重要驱动力.

关键词: 超分子凝胶; 荧光胶凝剂; 胆固醇; 剪切触变性

Synthesis and Gelation Behavior of a Fluorescent Active Low-Molecular Mass Organic Gelator Based on Cholesterol

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Abstract:

A new 7-nitrobenzo-2-oxa-1,3-diazol-4-yl-appended cholesterol derivative(NBD-C) was synthesized and characterized, and its gelation ability was evaluated in 30 solvents. It was found that NBD-C is an efficient gelator of acetonitrile, and the gel system possesses very smart thixotropic property. Scanning electron microscopy(SEM) observation showed that the gelator aggregated into different supramolecular structures in different solvents. FTIR, ^1H NMR and fluorescence spectroscopy studies revealed that in addition to the van der Waals interaction between the cholesterol units of the gelator molecules, intermolecular hydrogen-bonding also plays crucial rule for the spontaneous formation of the gel networks.

Keywords: Supramolecular gel; Fluorescent gelator; Cholesterol; Thixotropic property

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