

研究综述

荧光纳米晶制备及其与聚合物的复合组装

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收稿日期 2007-9-24 修回日期 网络版发布日期 2008-2-13 接受日期

摘要 纳米尺寸无机晶体(纳米晶)具有特殊的光、电和磁等性能, 但这类材料通常以胶体溶液或固体粉末的状态存在, 稳定性和分散性较差. 实现这类材料的应用, 需要将其与一些惰性介质复合, 从而提高稳定性和加工性. 聚合物材料作为一种有机惰性介质, 具有良好的材料兼容性和可加工性, 是稳定纳米晶材料的首选介质. 此外, 很多聚合物材料本身也具备特殊的性能, 可以对纳米晶性能进行有益的补充和调节. 因此, 功能纳米晶材料与聚合物复合, 将成为开启材料性能宝库的钥匙. 我们研究组结合自己的相关研究, 系统总结了荧光纳米晶材料与聚合物的复合组装方法, 着重阐述不同方法的优势及意义, 希望对从事这一前沿领域研究的人们有所启发.

关键词 [荧光纳米晶](#) [表面修饰](#) [聚合物](#) [复合组装](#)

分类号 [0631](#)

Preparation and Incorporation of Luminescent Nanocrystals into Polymer Composites

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Abstract Due to quantum confinement effect, inorganic nanocrystals (NCs) show unique size-dependent optical, electronic, and magnetic properties. However, NCs are usually in the form of colloidal solution or solid powder. For practical applications, moreover, it is required to incorporate these unstable NCs into inert matrix, such as polymer. In this context, polymer has a good compatibility with many materials, and can be easily molded to various shapes. Besides, some polymers inherently have stimulus-responsive properties, which are potentially used to tailor NC properties. Consequently, incorporation of NCs into polymers will bring many advantages, including the improvement of NC stability, combination of multiple functionalities in one system, and even modulation of NC properties in polymer matrix. In this review article, the methods of fabricating NC-polymer composites are systematically summarized with the aim to achieve a new generation of composite materials.

Key words [Fluorescent nanocrystal](#) [Surface modification](#) [Polymer](#) [Composite incorporation](#)

DOI:

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