

研究论文

单分散钛酸钡纳米晶的制备

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摘要 采用溶剂热法制备出表面包裹油酸的单分散立方相钛酸钡纳米晶, 晶粒平均尺寸为6.0 nm, 采用TEM和XRD对其微结构进行了表征; 研究了醇的链长度、油酸用量和热处理温度等对钛酸钡的相组成和形貌的影响规律。研究表明, 产物粒径较小, 粒度分布较窄, 单分散性较好, 其表面为非极性, 可溶于非极性试剂; 由于纳米晶表面由亲油性的长链烷基所覆盖, 与周围的水性环境不相容, 产生一定的斥力; 在重力和该斥力的共同作用下, 纳米晶可以有效地从液相环境中分离出来。

关键词 [钛酸钡](#) [单分散纳米晶](#) [控制合成](#)

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Preparation of Monodisperse Nanocrystalline Barium Titanate

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Abstract Monodisperse cubic BaTiO₃ nanocrystallines coated by oleic acid were synthesized through solvothermal method, and the average size of the nanoparticles was 6.0 nm. The microstructure of BaTiO₃ nanocrystallines was characterized by the techniques of XRD and TEM, while the effects of the length of alcohol chain, the content of oleic acid and heat treatment temperature on the phase composition and morphology of BaTiO₃ were also investigated. The result shows that the as-prepared nanoparticles have small size, narrow size distribution and good monodispersity, and the surfaces of which are nonpolar and can be dissolved in nonpolar solvent. Because the surfaces of nanocrystallines are coated by oleophilic long alkyl chain, they are incompatible with water surroundings to form some repulsion. With the coaction of gravity and repulsion, nanocrystallines can be separated effectively from liquid phase environment.

Key words [Barium titanate](#); [Monodisperse nanocrystals](#); [Controlled synthesis](#)

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