研究论文

BST和**BZT**系列固溶体的均相沉淀法合成及表征

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摘要　采用均相沉淀法, 在低温(90 ℃)、低pH值(8～9)、短时间(3～3.5 h)条件下成功地合成了系列$Ba_{1-x}Sr_xTiO_3$ (BST)和$BaZr_xTi_{1-x}O_3$ (BZT)固溶体. 通过XRD、化学分析法、SEM和AFM等手段表征了固溶体的结构、组成和形貌. 结果表明: BST, BZT的晶胞常数随组成呈线性关系, 符合Vegard定律, 该系列固溶体为完全互溶固溶体, 且目标产物组成精确, 颗粒为球形, 分布均匀. 初步讨论了复合矿化剂的均相化作用及羟基释放作用、分散剂对BST, BZT晶粒的聚集生长及分散机理.

关键词　均相沉淀法　掺杂　BST/BZT固溶体

分类号

Synthesis and Characterization of BST and BZT Solid Solutions through the Homogeneous Phase Precipitation Route

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Abstract　A series of $Ba_{1-x}Sr_xTiO_3$ (BST) and $BaZr_xTi_{1-x}O_3$ (BZT) solid solutions have been synthesized through the homogeneous phase precipitation route at low temperature (90 ℃) under low pH (8～9) in a short time (3～3.5 h). Structure, composition and morphology of those solid solutions were studied respectively by XRD, chemical analysis, SEM and AFM methods. The results showed that the cell parameters of them were linearly related with the composition of them, which was in accord with Vegard's law, and the powders of them had mutual miscibility, spherical shape, uniform distribution and precision component. The role of the compound mineralizer to make the reaction system form a homogeneous phase and release hydroxyl, and the mechanism of the aggregation growth of the BST and BZT particles in solutions with dispersants, were discussed briefly in this paper.

Key words　homogeneous phase precipitation route　adulteration　BST or BZT solid solution

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