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Containerless Melting and Synthesis of Eutectic BaTiO₃/CoFe₂O₄ by Microwave Irradiation

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Abstract

Eutectic BaTiO₃/CoFe₂O₄ was synthesized using a developed BN diffuser by containerless microwave processing. The crystallized BaTiO₃ and CoFe₂O₄ was obtained from melt of quinary system Ba-Ti-Co-Fe-O. Samples included eutectic BaTiO₃/CoFe₂O₄ structure with fine dendrite structure and primary crystal of CoFe₂O₄. The microstructure became finer with decreasing the weight ratio of CoFe₂O₄. The microstructure was finer in solidification with levitation than in solidification without levitation.

Keywords: Containerless processing, eutectic oxides, microwave processing, multiferroic

1. Introduction

BaTiO₃/CoFe₂O₄ composite with fine structure is expected to apply for a new device such as multiferroic materials[1, 2]. One of the strategies for enhancement of magnetoelectric effects is to introduce indirect coupling, via strain, between a ferromagnet and ferroelectric materials[3, 4]. Recently, novel sintering process was conducted to prepare the particulate

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