

## 钛酸钡陶瓷材料的制备及电磁性能研究

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**摘要** 采用溶胶-凝胶法制备出了钛酸钡陶瓷粒子, 观察和分析了粒子的成分、形貌和微观结构及其对电磁波的吸收性能, 并测定了粉体的复介电常数和磁导率.

XRD和TEM分析表明制备的粒子为四方相, 粒径在30~40nm左右. 制备的钛酸钡/环氧树脂复合吸收材料在8~18GHz范围内对电磁波有良好的吸收效果, 当含量为20%时效果最佳.

最后针对其吸收特性探讨了钛酸钡粒子的吸收机理.

**关键词** [陶瓷材料](#) [钛酸钡](#) [电磁性能](#) [吸波机理](#)

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## Synthesis of Barium Titanate and Its Electromagnetic Properties

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**Abstract** The ceramic material of barium titanate (BT) was synthesized by a sol-gel method. The microstructure and morphology of the powders were characterized by IR, XRD and TEM. The dielectric constant and permeability of the mixture of BT powders and paraffin wax were measured. The microwave absorbing performance of BT powder and epoxide (EP) resin composite was studied in the frequency range of 8--18GHz. The results show that the BT powder exists in the form of tetragonal phase with the size in the range of 30--40nm. The BT/EP composite exhibits good microwave absorbing performance in the frequency range of 8--18GHz, when the content of BaTiO<sub>3</sub> is 20vol%, the performance is the best. The

microwave absorption mechanism of BaTiO<sub>3</sub> powders is mainly due to the dielectric relaxation. The BT powder will be a good candidate for microwave absorbing materials.

**Key words** [ceramic material](#) [barium titanate](#) [dielectric properties](#) [microwave absorption mechanism](#)

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