首页 | 关于本刊 | 编 委 会 | 最新录用 | 过刊浏览 | 期刊征订 | 下载中心 | 广告服务 | 博客 | 论坛 | 联系我们 | English















航空学报 » 2005, Vol. 26 » Issue (2):250-253 DOI:

论文

最新目录 | 下期目录 | 过刊浏览 | 高级检索

<< Previous Articles | >>

莫来石陶瓷的制备、微波介电特性及其对材料吸波性能的影响

张富宽, 罗发, 朱冬梅, 周万城

西北工业大学 凝固技术国家重点实验室, 陕西 西安 710072

Preparation, Microwave Properties of Mullite Ceramic and Their Effects on Microwave Absorbing Materials

ZHANG Fu-kuan, LUO Fa, ZHU Dong-mei, ZHOU Wan-cheng

State Key Laboratory of Solidification Processing, Northwestern Polytechnical University, Xi'an 710072, China

摘要 相关文章 参考文献

Download: PDF (158KB) HTML OKB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 采用热压烧结法,用SiO₂溶胶和Al₂O₂溶胶制备的莫来石溶胶制备了莫来石陶瓷,研究了莫来石陶瓷的微波介电特性与烧结致密度之间的关 系。研究表明,当莫来石陶瓷的烧结致密度从91.4%升高到97%时,其复介电常数的实部 $oldsymbol{arepsilon}$ 从3.85增加到的5.87,虚部 $oldsymbol{arepsilon}$ "从0.04增加到0.11。当 添加MgO烧结助剂后,莫来石陶瓷复介电常数的实部和虚部明显升高。将莫来石陶瓷作为吸波材料阻抗变换层,能够大幅度提高材料的吸波性能。 这主要是由于采用的莫来石阻抗变换层的波阻抗较高,为156Ω,减小了空气与吸收层界面上电磁波的反射,使更多的电磁波进入了吸收层而被损

关键词: 莫来石陶瓷 吸波材料 复介电常数 反射率 阻抗

Abstract: Mullite ceramic is prepared by hot-pressing method from a mixture of SiO_2 sol and Al_2O_3 sol and from a mixture of SiO₂ and Al₂O₃ powders, respectively. The relationships between permittivities and sintering conditions of mullite ceramic are discussed. The samples' permittivities are measured in the frequency range of 8.2~12.4GHz. The results show that the real and imaginary parts of permittivities of the samples increase with the sintering densities. The real and imaginary parts of permittivity of the samples increase when additive MgO is used. Mullite ceramics with different permittivities can be obtained through varying their preparation condition. When the as-formed mullite ceramic is used as an impedance transfer layer of the microwave absorbing material, it greatly enhances the microwave absorbing efficiency of absorbing materials. The mechanism of the enhancement of absorbing efficiency is that the addition of mullite ceramic to and absorbing material lowers the interface reflection between air and the absorbing material, more microwave enters the absorbing material and is dissipated. There exist different effects from ceramics which are prepared under different conditions. So an exact preparation condition of the mullite ceramic is required for expected characteristics of the microwave absorbing material.

Keywords: mullite ceramic microwave absorbing material permittivity reflectivity impedance

Received 2004-04-21; published 2005-04-25

引用本文:

张富宽; 罗发; 朱冬梅; 周万城. 莫来石陶瓷的制备、微波介电特性及其对材料吸波性能的影响[J]. 航空学报, 2005, 26(2): 250-253.

ZHANG Fu-kuan; LUO Fa; ZHU Dong-mei; ZHOU Wan-cheng. Preparation, Microwave Properties of Mullite Ceramic and Their Effects on Microwave Absorbing Materials[J]. Acta Aeronautica et Astronautica Sinica, 2005, 26(2): 250-253.

Service

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ Email Alert
- **▶** RSS

作者相关文章

- ▶ 张富宽
- ▶ 罗发
- 朱冬梅
- ▶周万城

Copyright 2010 by 航空学报