



## 论文摘要

中南大学学报(自然科学版)

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Vol.40 No.3 Jun.2009

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文章编号: 1672-7207(2009)03-0638-06

### 羟基磷灰石/氟金云母复合的生物玻璃陶瓷的力学性能

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**摘要:** 通过粉末冶金方法制备羟基磷灰石玻璃/氟金云母生物医用玻璃陶瓷材料。利用力学性能检测、显微观察和相成分分析等手段, 研究烧结温度以及玻璃相含量对材料抗弯强度、断裂韧性和硬度等力学性能的影响。结果表明: 随着烧结温度的升高, 材料的致密度不断提高, 力学性能也得到改善, 对于含80%氟金云母的玻璃陶瓷而言, 抗弯强度从1 000 °C的55.1 MPa, 提高到1 100 °C的120.1 MPa。随着玻璃陶瓷中氟金云母的增加, 材料的抗弯强度、弹性模量、断裂韧性都有所提高。当氟金云母的含量达到80%时, 得到的玻璃陶瓷复合材料的力学性能最佳。组分对HA/FG生物医用玻璃陶瓷力学性能的影响主要归因于其对材料致密度、相组成和结晶度的作用。

**关键字:** 羟基磷灰石; 氟金云母; 生物医用材料; 力学性能

### Mechanical properties of hydroxyapatite/fluorophlogopite bioglass-ceramics prepared by powder metallurgy

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**Abstract:** Hydroxyapatite/mica biomedical glass-ceramics were prepared by powder metallurgy. The effects of sintering temperature and composition on bending strength, fracture toughness and hardness were studied through mechanical properties test, microstructure observation and phase constitution analyses. The results show that with sintering temperature increasing, the density increases and the mechanical properties are improved. For the glass-ceramics with 80% mica, the bending strength increases from 55.1 MPa after sintered at 1 000 °C to 120.1 MPa after being sintered at 1 100 °C. With the increase of mica content, the bending strength, elastic modulus and fracture toughness increase. The effects of composition on mechanical properties are attributed to its effects on density, phase constitution and crystallinity.

**Key words:** hydroxyapatite; fluorophlogopite; biomaterials; mechanical properties

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