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燃烧合成-水热法制备生物陶瓷涂层

刘咏, 刘芳, 周科朝, 张伟

(中南大学粉末冶金国家重点实验室, 湖南长沙, 410083)

摘要: 采用燃烧合成-水热法制备生物陶瓷涂层,用X射线衍射(XRD)、扫描电镜(SEM)和粘接拉伸法研究了涂层物相组成、形貌以及涂层与基体的界面结合强度. 研究表明: 燃烧合成后, 涂层主要由HA+ β -Ca₃(PO₄)₂组成, 水热处理2 h后, 涂层中HA含量增加, 延长水热处理时间, 可得到纯HA涂层; 涂层厚约为20 μ m; 在燃烧合成试剂中添加助燃剂, 涂层中相成分复杂化, 但水热处理10 h后, 可得到纯羟基磷灰石相, 涂层厚度增加, 达到50 μ m左右; 同时, 添加助燃剂可大大提高界面结合强度, 达到13.66 MPa.

关键字: 燃烧合成-水热法; 生物陶瓷; 涂层; 界面结合强度

The preparation of bioceramic coating by combustion synthesis-hydrothermal treatment

LIUYong, LIUFang, ZHOUKe-chao, ZHANGWei

(State Key Laboratory for Powder Metallurgy, Central South University, Changsha 410083, China)

Abstract: Bioceramic coating is prepared by combustion synthesis-hydrothermal treatment. XRD, SEM and bonding-tensile are used to analyze the phase composition of coating, microstructure and the bonding strength. The results show that the coating is composed of HA and β -Ca₃(PO₄)₂ after combustion synthesis. After hydrothermal treatment for 2 h, the volume of HA increases. A coating whose thickness is 20 μ m and pure HA is obtained. When combustible substance is added, mixed phase appears but changes into pure HA after hydrothermal treatment for 10 h. The coating thickness is 50 μ m and the bonding strength increases to 13.66 MPa.

Key words: combustion synthesis-hydrothermal treatment; bioceramic; coating; the binding strength

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地 址：湖南省长沙市中南大学 邮编： 410083

电 话： 0731-88879765 传真： 0731-88877727

电子邮箱： zngdx@mail.csu.edu.cn 湘ICP备09001153号