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研究论文

CPP/β--TCP双相磷酸钙陶瓷的制备

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摘要:

将聚磷酸钙(CPP)与生物羟基磷灰石(HA)复合制备出非晶态CPP/晶态β--TCP新型双相磷酸钙生物陶瓷, 研究了CPP的含量和煅烧温度对其相组分、烧结性能和力学性能的影响。 结果表明, 高温下HA与CPP反应生成β--磷酸三钙(β--TCP)和水。 当初始原料中CPP的含量(质量分数, 下同)高于10%时, 可制备出新型双相磷酸钙生物陶瓷CPP/β--TCP; 当CPP的含量低于10%时, 可制备出以HA/β--TCP为主相的复相陶瓷。 在CPP含量为0--15%、煅烧温度高于1250℃或CPP含量为15%--30%、煅烧温度为1150--1250℃的条件下,都可制备出抗压强度较高的复相磷酸钙陶瓷。

关键词: 无机非金属材料 双相磷酸钙 烧结 CPP /β-TCP

Combining Calcium Polyphosphate with Hydroxyapatite for CPP/β–TC Biphasic Calcium Phosphate Bio–ceramic

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Abstract:

A novel biphasic calcium phosphate (BCP) amorphous CPP/crystalline β–TCP was prepared by adding calcium polyphosphate (CPP) into hydroxyapatite (HA). The effects of CPP dosage (mass fraction) on the phase compositions, sintering property, and mechanical strength of the composite were investigated. Results show that CPP would react with HA to produce β–calcium phosphate (β–TCP) and H2O, excessive dosage of CPP (>10%) would obtain a novel BCP (β–TCP and amorphous–CPP), and less dosage of CPP (<10%) would obtain a traditional BCP (HA/β–TCP). Meanwhile, high compressive strength could be obtained either at high sintering temperature (>1250^{o}C) with small (0–15%) CPP dosage or at high CPP dosage (15–30%) at intermediate sintering temperature (1150–1250 ^{o}C).

Keywords: Nonmetallic and inorganic materials Biphasic calcium phosphates Sintering CPP /β-TCP

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