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论文

利用 Fe^{2+} 对羟基磷灰石粉末表面改性的研究

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摘要:

因其独特的化学组分和晶体结构,羟基磷灰石(HA)可通过引入金属离子实现表面改性,即将制备的HA粉末放入含有二价铁离子的溶液中, Ca^{2+} 与具有小离子半径的 Fe^{2+} 完成离子交换.对改性粉末进行表征后发现,HA粉末的表面电势、OH和 PO_4 基团的伸缩振动频率以及(001)晶面的间距都发生了变化.另外,在含油酸钠的溶液中 Fe^{2+} 改性的HA粉末与阴离子电解质间的化学键合能力大大下降.本研究可模拟人体骨骼和牙齿中的 Ca^{2+} 被体内循环系统中 Fe^{2+} 取代的情况.

关键词: 纳米材料;羟基磷灰石;表面改性;晶体结构

Study of surface modification of hydroxyapatite powers by ions of ferrous iron

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Abstract:

Due to its specific composition and microstructure, surface modification of hydroxyapatite (HA) was expected with the entry of a metal ion. In this study, HA powders were synthesized and immersed in solutions containing ions of ferrous iron. Ion exchange between Ca^{2+} and Fe^{2+} with a smaller ionic radius were characterized and investigated. This modification resulted in variation of surface charges of HA particles, frequencies of OH and PO_4 stretching vibration, as well as lattice spaces of (001) planes. Also, the chemical bond between HA powders and anionic electrolyte in solutions containing sodium oleate became weak after modification of HA surface by Fe^{2+} . The purpose of the present work is stimulating the substitution of Ca^{2+} ions in bones and teeth by ions of ferrous iron in circulatory systems of human beings.

Keywords: nanomaterials; hydroxyapatite; surface modification; crystal structure

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