

### 论文摘要

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### 纯镁在模拟体液中的腐蚀机理

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**摘 要:** 考察纯镁浸泡于模拟体液(SBF)中所发生的化学和物理过程, 实验材料为扩散退火态, 浸泡时间3-21 d。结果发现, 镁的腐蚀速率随时间增加而降低, 同时溶液pH递增; 裂纹和腐蚀坑是材料损伤的主要形貌特征, 而 $MgCl_2$ 的局部富积是形成腐蚀坑的重要原因; 随着浸泡时间延长,  $Mg(OH)_2$ 沉积于试样表面并逐步增长, 成为Ca、P在Mg表面沉积的屏障, 因此抑制 $Mg(OH)_2$ 的形成和生长是诱导磷酸钙陶瓷在Mg表面沉积的必要条件。

**关键字:** 纯镁; 模拟体液; 腐蚀;  $Mg(OH)_2$ ; 羟基磷灰石

### Mechanism of pure magnesium corrosion immersed in simulated body fluid

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**Abstract:** The chemical and physical processes of magnesium immersed in SBF were investigated. The samples were as-annealed; the immersion time was 3-21 d. The result shows that as the immersion time increases, the corrosion rate decreases while the SBF pH increases. Network-like cracks and pits are the main damages resulting from corrosion. The locally buildup of  $MgCl_2$  is the major cause of pitting. A  $Mg(OH)_2$  forms and gradually covers the sample surface. This layer acts as the barrier for the precipitation of Ca and P on the sample surface, thus it is crucial to depress the formation of  $Mg(OH)_2$  in order to have calcium phosphate bioceramics deposit on magnesium surface.

**Key words:** pure magnesium; simulated body fluid(SBF); corrosion;  $Mg(OH)_2$ ; hydroxyapatite

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