

Effect of Extrusion on Mechanical Properties and Structures of Zn-Mg Alloys for Biomedical Applications

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Zn-Mg alloys, in which Mg is an alloying element, are proposed for medical applications as a promising biodegradable material for temporary implants in orthopedics or traumatology. They can be used to replace nonfunctional or damaged tissues. When the healing process of tissues is finished, the Zn-Mg alloys are gradually decomposed in a human body and a reoperation is therefore unnecessary. Their mechanical properties must be similar to the characteristics of human bones. Large grains are typical for the structure of cast alloys. Pure Zn and Zn-0.8Mg alloy were cast and subsequently extruded at 300°C. The structure and mechanical properties (Vickers hardness, compressive and tensile strength tests) of the cast alloys were compared with those of the extruded alloys. Pure Zn and Zn-0.8Mg alloy after the extrusion had a fine-grained structure and showed better values of mechanical properties in comparison with the cast alloys.

Keywords: Biodegradable material, Zn-Mg alloys, Extrusion

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