Magnesium Alloys for Implants

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Extraordinary properties of magnesium alloys, biodegrability and low density guarantee that these alloys are suitable for using in medicine as bone implants. So far there have been used alloys of titanium, cobalt and stainless steel for this purpose. Among the mentioned materials the magnesium alloys are winning because of their mechanical properties, which are more similar to human bones and at the same time there is the possibility to reduce the number of surgeries because of the spontaneous implant disintegration. Pure magnesium reaches neither the requested mechanical properties nor the corrosion resistance. That is why people are searching for elements, whose supplement would improve these magnesium properties to acceptable values. In this paper there was examined the influence of alloying elements (zinc, yttrium) on mechanical properties, the shape and the size of pores in the structure of magnesium alloys. Apart from alloying elements, a pores creating agent was also added to create pores with the diameter of more than 200 μm in the structure of magnesium alloys. Pores of this size allow the bone cells to grow in the implant and enable its gradual replacement by the bone. All samples were prepared by the method of powder metallurgy.

Keywords: implant, magnesium alloys, biomaterial, porous

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