



MECHANICAL INVESTIGATION OF AZ91D MAGNESIUM ALLOY AS A BIOMEDICAL IMPLANT

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Abstract

In this investigation, Mg-based biodegradable implant with controlled porosity and micro-textured surface was designed and manufactured by using powder metallurgy (P/M) route. Mg powders with different size distribution were compacted under three different compaction pressures (150, 200 and 250 MPa) at 150°C for 1 min. Compacted green plates were sintered to improve mechanical properties of Mg plates at 380, 400 and 420°C for 60, 180 and 300 min. This study was aimed to determine an optimal window of pressure, temperature and time to manufacture Mg implants with necessary levels of porosity and strength for eventual biocompatibility and biodegradability tests. The results proved that compaction load had a significant effect on the bending strength. Moreover, it can be concluded that porous Mg based biomedical implant was feasible because of near net shape production with acceptable mechanical integrity.

Keywords: Micro manufacturing, design of experiment, biomedical implant, magnesium powder

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