

17th International Conference and Exhibition on
NANOMEDICINE AND NANOTECHNOLOGY IN HEALTHCARE

November 23-24, 2017 Melbourne, Australia

Preparation and evaluation of silicon-containing coatings on bioabsorbable Mg/27.5HA nanocomposite for bone tissue engineering

Shahrouz Zamani Khalajabadi
University Technology Malaysia, Malaysia

A powder metallurgy technique to fabricate silicon and magnesium-oxide coated magnesium-based bionanocomposite with hydroxyapatite has been developed. The sample coated with double layer MgO/Si was compared with bare Mg/27.5HA nanocomposite and the sample coated by Si layer only. The surface microstructure and the cross-section of bare and coated samples before and after corrosion were examined by field-emission scanning electron microscopy (FE-SEM). The corrosion performance of bare and coated samples was evaluated using potentiodynamic polarization, electrochemical impedance spectroscopy and immersion tests. A decrease from 4.28 to 0.65 mm/year was observed in corrosion rate of Mg/27.5HA nanocomposite with monolayer Si-coating. The results indicated that the corrosion resistance of Mg/27.5HA nanocomposite was significantly improved by MgO/Si double layer coating. Moreover, MgO/Si coating is promising to enhance biocompatibility of Mg/27.5HA nanocomposite for implant application. Antibacterial tests of the bare and coated samples revealed their antibacterial activity against *Staphylococcus aureus* and *Escherichia coli*.

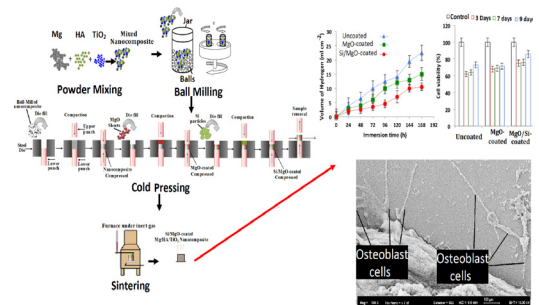


Figure-1: The schematic image of process of preparation of MgO/Si-coated Mg/HA/TiO₂ bionanocomposite and biological investigation on this material.

Recent Publications

1. Khalajabadi S Z, Ahmad N, Izman S, Haji Abu A B, Haider W and Abdul Kadir M R (2017) *In vitro* biodegradation, electrochemical corrosion evaluations and mechanical properties of an Mg/HA/TiO₂ nanocomposite for biomedical applications. *Journal of Alloys and Compounds*; 696: 768-781.

Biography

Shahrouz Zamani Khalajabadi is a Post-Doctoral Fellow of MJIT at UTM-KL University. He has received his PhD in Biomedical Engineering at the University of Technology Malaysia, where he studied magnesium-based bionanocomposites for bone replacement. His research interests are in the biodegradable implants, the surface coatings for medical applications and nanocomposites. He has collaborated actively with researchers in other disciplines of materials science, particularly biomaterials.

shahroozamany@yahoo.com