



Advanced Materials and Engineering Technologies

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Editors

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 Springer

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Preface

The chapters in *Advanced Materials and Engineering Technologies* are one of the outputs from the 2nd International Conference on Marine and Advanced Technologies 2021 (ICMAT 2021). Most of the papers reveal the best practice and discuss the theory in relation to multi-disciplinary approaches in materials engineering technology. This book demonstrates various real-world and global engineering problems while touching on evolving design strategies. Among the topics are advanced materials, applied science, marine engineering, and energy application. Throughout the text, the reader can adapt these research findings to the design and analysis of materials in engineering practices. In addition, this book generates interests, ideas, and appropriate teaching support for lifelong the learning process.

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The Effect of PLA/HA Coating Thickness on Crack Formation and Corrosion Performance

Mas Ayu Hassan , Zubaidah Zamri, Rosdi Daud, Norizah Redzuan & Izman Sudin

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Abstract

Surface modification of metallic implants is often required to facilitate positive interaction between the implant and the surrounding hard tissue. In this study, a polymer-ceramic composite coating of polylactic acid/hydroxyapatite (PLA/HA) was successfully deposited on a Co–Cr–Mo alloy by the dip coating method in chloroform suspension at room temperature. The effect of various PLA/HA dipping layers was studied and the dip coating process parameters were optimized in order to obtain a homogeneous, crack free, densely packed and adhesive coating. It is found that PLA/HA-coated substrate with 3 dipping layers were denser and less crack sensitive compared to 6 dipping layers. Although it is hypothesized that a coarser coated surface helps to facilitate ingrowth of osseous tissue in human body, but current findings show opposite manners due to the fact that a higher corrosion rate was obtained. The coated substrate with 6 dipping layers also were found more profound to micro-cracks and delamination with a lower microhardness value compared to coated substrate with 3 dipping layers.

Keywords

Co–Cr–Mo

PLA/HA coating

Biomaterial

Surface morphology

Dip coating

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