UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF ZINC DOPED HYDROXYAPATITE VIA WET-PRECIPITATION AT DIFFERENT TEMPERATURE

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Dissertation submitted in partial fulfillment
of the requirements for the degree of
Diploma in Mechanical Engineering

College of Engineering

January 2024

ABSTRACT

The final project involves the development of Hydroxyapatite (HA) dopes with Zinc ion for artificial cranium. The major aim of completing the project is to use the dopes hydroxyapatite with Zinc in an artificial cranium. This abstract presents a quick view of the experiment was conducted to investigate the effects of Zinc doping on the properties of HA for application in artificial craniums. Hydroxyapatite (HA) has been widely uses as a biomaterial in the field of craniofacial surgery due to its excellent biocompatibility and resemblance to the natural bone mineral. However, pure HA exhibits limit mechanical strength, which can be a significant drawback in the context of cranial bone replacements. To address this issue, the incorporation of metallic ions, such as Zinc, into HA has shown promise in enhancing both mechanical properties and biological functionality. Zinc is known to play a crucial role in improving bone regeneration. Therefore, this project aims to prepare hydroxyapatite dopes with zinc (ZnHA) via the wet precipitation method to use on artificial cranium for better patient outcomes and

To analyse the effect of different temperature on ZnHA and HA microstructure of the hydroxyapatite after dopes with Zinc. In terms of methodology, the ZnHA was analyses using Fourier –transform infrared spectroscopy (FTIR) and the microstructure of the ZnHA were observed using microscope. This project focuses on the synthesis, characterization, and evaluation of zinc-dopes hydroxyapatite for application in artificial cranial implants. The outcome of this project is HA with enhance mechanical strength after being dopes with Zn to improve in terms of biocompatibility. The successful development and validation of zinc-dopes hydroxyapatite as an artificial cranial material would offer a novel and effective solution for patients requiring cranial bone reconstruction. The project findings can potentially contribute to advancements in craniofacial surgery, leading to improves patient outcomes and better quality of life for individuals with cranial defects or injuries.

ACKNOWLEDGEMENT

Firstly, I wish to thank God for giving me the opportunity to embark on my diploma and for completing this long and challenging journey successfully. My gratitude and thanks go to my supervisor, Ts Dr Shahrul Hisyam bin Marwan

Finally, this dissertation is dedicated to my father and mother for the vision and determination to educate me. This piece of victory is dedicated to both of you. Alhamdulillah's.

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