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Hydroxyapatite from seashell (anadara granosa) for bone substitution / G Baanu Jivitha Gengadharan.



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**HYDROXYAPATITE FROM SEASHELL (*ANADARA GRANOSA*) FOR BONE
SUBSTITUTION**

By
G Baanu Jivitha a/p Gengadharan

A thesis submitted in partil fulfilment of
the requirement for the award of the degree of
Bachelor of Applied Science (Physics, Electronics and Instrumentation)

**FACULTY OF SCIENCE AND TECHNOLOGY
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk **HYDROXYAPATITE FROM SEASHELL (*ANADARA GRANOSA*) FOR BONE SUBSTITUTION** oleh **G BAANU JIVITHA A/P GENGADHARAN**, no. matrik: **UK 15471** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Fizik sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains Gunaan (Fizik Elektronik & Instrumentasi), Fakulti Sains dan Teknologi, UMT.

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DECLARATION

I hereby declare that this thesis entitled Hydroxyapatite from Seashell (*Anadara Granosa*) for Bone Substitution is the result of my own research except as cited in the references.

Signature : 

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HYDROXYAPATITE FROM SEASHELL (*ANADARA GRANOSA*) FOR BONE SUBSTITUTION

ABSTRACT

Hydroxyapatite $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ is an important biomaterial and is the principal inorganic constituent of bones and teeth. It is also used as the replacement of heart valves, hip joints and other implants in the human body. A novel procedure to produce porous hydroxyapatite from the waste seahells is reported.. The seahells were thermally treated and hydroxyapatite was produced from the calcined seahells through chemical route. The morphology of hydroxyapatite produced from seashell is analyzed by using Scanning Electron Microscope and the element composition of different phase is identified by using Energy Dispersive X-Ray. The powder was characterized by X-Ray Diffraction and Fourier Transform Infrared Spectroscopy (FTIR). Hydroxyapatite that produced with a smaller particle size and higher temperature is $53\mu\text{m}$ with the temperature of 550°C .

Keywords: Hydroxyapatite; seahells; implant; termal; particle size and temperature

HIDROKSIAPATIT DARIPADA KULIT KERANG (*ANADARA GRANOSA*) UNTUK PENGGANTIAN TULANG

ABSTRAK

Hidroksiapatit $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ ialah satu biomaterial yang penting dan juga suatu prinsipal jujuk bagi tulang dan gigi. Hidroksiapatit ini digunakan dalam penggantian injap jantung, sambungan pinggul dan juga bahan impalan lain di dalam badan manusia. Suatu kaedah untuk menghasilkan hidroksiapatit dilaporkan. Kulit kerang dirawat secara termal dan hidroksiapatit dihasilkan melalui pembakaran kulit kerang dengan dirawat oleh bahan-bahan kimia. Morpologi bagi hidroksiapatit yang dihasilkan ini dianalisa dengan menggunakan Scanning Electron Microscope (SEM) dan komposisi elemen untuk fasa yang berbeza disahkan dengan Energy Dispersive X-Ray (EDS). Serbuk itu juga dikaji dengan menggunakan Fourier Transform Infrared Spectroscopy (FTIR) dan juga X Ray Diffraction (XRD). Hidroksiapatit bermutu tinggi yang dihasilkan ialah dengan size partikal yang kecil iaitu $53\mu\text{m}$ dan suhu yang tinggi iaitu 550°C .

Kata kunci: Hidroksiapatit; kulit kerang; bahan impalan; termal; saiz partikal dan suhu