بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

MONA MAGHRABY

COMPARATIVE STUDY ON PRODUCTION METHODS OF POROUS HYDROXYAPATITE

By

Sondos Ibrahim Soliman Eissa

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
Chemical Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

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2021

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Title of Thesis:

Comparative Study on Production Methods of Porous Hydroxyapatite

Key Words:
Porous ceramics ; Hydroxyapatite; Starch consolidation casting; Direct coagulation casting; Freeze gel casting

Summary:

Hydroxyapatite is one of the famous calcium phosphate bioceramics. In latest years, porous HA has attracted more attention due to its low density, high porosity, high specific area, and high bioactivity. Hydroxyapatite powder was synthesized and characterized using XRD, IR, TEM, SEM and both (TGA & DTG). Fabrication of hydroxyapatite into porous samples was carried out by three different casting methods (starch consolidation, direct coagulation and freeze gel casting methods) with three different HA powder contents and fired at three different firing temperatures. Porosity, density and mechanical compression strength were measured for all porous hydroxyapatite samples. All porous hydroxyapatite samples were characterized by XRD. SEM was used to study the microstructure of some selected porous HA samples. As a result of this work, pure hydroxyapatite powder was successively prepared by wet precipitation method. The results concluded that porous HA samples prepared by freeze gel casting method showed higher mechanical strength (50.2 MPa) and thermal stability until 1200 ^{0}C than those prepared by other methods.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Sondos Ibrahim Soliman Eissa Date:

Signature:

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Eng. Sondos Ibrahim Soliman

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Table of Contents

List of Figures