



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



MONA MAGHRABY



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التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY



Cairo University

PRODUCTION OF MODIFIED MONOLITH SILICA NANOCOMPOSITE AEROGEL

By

Mai Mohamed Elshahidy Ibrahim

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

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Under the Supervision of

**Prof. Dr. Shakinaz Taha
El Sheltawy**

Dr. Ahmed Shalaby Ali Shalaby

.....
Professor in Chemical Engineering
Department
Faculty of Engineering, Cairo University

.....
Doctor in STCE
National Organization of
Military production

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Approved by the
Examining Committee

Prof. Dr. Shakinaz Taha El Sheltawy

Thesis Main Advisor

Prof. Dr. Hanem Abd El Rahman Sibak

Internal Examiner

Prof. Dr. Maha Moustafa Abdelkader El Shafei External Examiner

Director of Sanitary and Environmental Engineering Institute Housing and Building National
Research Center

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
2020

Engineer: Mai Mohamed El shahidy Ibrahim
Date of Birth: 1 / 10 / 1985
Nationality: Egyptian
E-mail: m-eng-2007@hotmail.com
Phone.: 01032240082
Address: 12 st. El Nagar – Zagazig- Sharqia
Registration Date: 1/ 3 /2015
Awarding Date: / /2020
Degree: Doctor of Philosophy
Department: Chemical Engineering
Supervisors: **Prof. Dr.** Shakinaz Taha El Sheltawy
Dr. Ahmed Shalaby Ali Shalaby



Examiners: **Prof. Dr.** Shakinaz Taha El Sheltawy (Thesis Main Advisor)
Prof. Dr. Hanem Abd El Rahman Sibak (Internal Examiner)
Prof. Dr. Maha Moustafa Abdelkader El Shafei (External Examiner)
Director of Sanitary and Environmental Engineering Institute Housing and
Building National Research Center

Title of Thesis: PRODUCTION OF MODIFIED MONOLITH SILICA NANOCOMPOSITE AEROGEL

Key Words: Silica aerogel- Nano silver/silica aerogel- oil spills clean-up- Ambient pressure drying

Summary:

Production of water-repellent modified silica aerogel with a high surface area and extremely low-density is a target of this study, considers a novel solution for oil spills clean-up in the last years. Super hydrophobic monolith structure of modified silica aerogel samples with very low-density and high surface area have been successfully synthesized via a novel modified sol-gel preparation route under ambient pressure drying by using Tetraethyl orthosilicate/Triethoxy(vinyl)silane/Ethylene glycol as a precursor. By studying different parameters, the oil adsorption capacity was enhanced to reach 7 times from a weight of aerogel. Also, by doping silver, the antimicrobial activity was enhanced in order to prevent the biofilms and keep the oil adsorption efficiency. All samples were expected to be a promising absorbent candidate in order to apply it in oil spill clean-up applications.

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: Mai Mohamed Elshahidy Ibrahim

Date: / /

Signature:

Dedication

I wish to dedicate my deep thanks to my family especially my father, my mother, my brother, and my sisters for supporting me in all kind of situations.

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