



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



HANAA ALY



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 تغييرات



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HANAA ALY



Cairo University

KINETICS OF BIOCHAR FORMATION FROM AGRICULTURAL WASTE

By

Fatma Elzahraa Mahmoud Mohammed Mahmoud

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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Prof. Dr. Magdi Fouad Abadir

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Approved by the
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Title of Thesis:

Kinetics of biochar formation from agricultural waste

Key Words:

Kinetics, Agricultural waste, Thermal analysis, Biochar, and Combustion

Summary:

The present thesis deals with the investigation of the kinetics of combustion of three agricultural waste for the dual sake of safely eliminating a waste and energy production. The three wastes investigated were orange peels, banana peels and bagasse, the fibrous residue from the sugar cane industry. In all cases, thermal analysis in air was carried out at four different heating rates and five different kinetic models applied in order to determine the steps of degradation, the conditions of formation of biochar, the activation energy of the various steps of degradation and the possible controlling step. The thermal analysis curves obtained displayed the variation of mass with temperature (TG) and rate of change with respect to time (DTG).

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: Fatma Elzahraa Mahmoud Mohammed Mahmoud Date: .././2021

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