بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

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قسم

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MONA MAGHRABY

UTILIZATION OF AGRO WASTES FOR BIODEGRADABLE COMPOSITES FABRICATION AND NANOCELLULOSE ISOLATION

By

Sherif Fathy Ahmed Mehanny

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
Mechanical Design and Production Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
GIZA, EGYPT
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Key Words:
Lignocellulose, Valorization, Composite, Nanocellulose; Acidic Hydrolysis.

Summary:

Four studies were conducted to valorize cellulosic wastes. Study 1 revealed that small ingredient of animal glue in bagasse TPS composite, drastically increased strength from 4 to 20 MPa at low temp. Study 2 yielded that flax TPS composite was the most recalcitrant to biodegradation. Study 3 showed that pulped bleached poplar is good candidate to extract cellulose nanocrystals. Study 4 exhibited that pulped unbleached palm can yield lignin containing spherical nanocellulose. Results depicted in this thesis widen horizon of biowaste valorization to construct versatile materials.

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.

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Signature:

Dedication

To the most beloved souls, father and brother (Late General Major Eng. / Fathy Mehanny and Late Colonel Eng. / Ahmed Fathy Mehanny) for their unforgettable love and support.

To my perseverant encouraging affectionate mother Mrs. / Nagwa Fayad.

To my brother Eng. / Amr Fathy Mehanny who continuously provide direction and advice

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