

International University of Africa

Deanship of Graduated Studies



Extraction of *Jatropha Curcas*

Non - Edible Oil

A Thesis Submitted Partial Fulfillment of the Requirements for the Degree of
M.Sc. in Industrial Chemistry.

By:

Yasmin Bain Mohammed Adam

Supervisor:

Prof: Babiker Karama Abdalla

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Acknowledgement

All my thanks to my god, who help me completing this research

I would like to express my deep gratitude to my respectable supervisor

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Thanks are extended to my brother, sister and my friends for their encouragement.

Dedication

Of taught me to withstand whatever the circumstances have changed

Dear mother

the cause of my life

My father beloved

And respected you transfiguration,

To my brothers and my family.

المخلص

في هذا العمل تم إجراء الدراسات لإنتاج وقود الديزل الحيوى من زيت الجاتروفا الخام بعد استخلاصه ميكانيكيا الذي يحتوى على نسبة عالية من الاحماض الدهنية الحرة ونسبة للمحتوي العالي من الاحماض الدهنية الحرة تم إنتاج الوقود من زيت الجاتروفا في خطوتين إنشاء الخطوة الأولى تم تقليل الاحماض الدهنية الحرة إلى اقل من 2% باستخدام النسبة المولية (الميثانول-الزيت) وحمض الكبريتيك 2% لمدة ساعة واحدة عند درجة حرارة 60 درجة مئوية وترك الخليط ساكنا لمدة ساعتين تمت إزالة الطبقة السفلي التي تحتوي على الميثانول والماء في خطوة الثانية هي عملية الاسترة باستخدام المعدل المولي (الميثانول - الزيت) 1-5 والعامل الحفاز القاعدي هيدروكسيد الصوديوم 55. %.

الحد الاقصى العائد من وقود الديزل في خطوة أولي عند 60 درجة مئوية وخطوة ثانيه هو 93% وهو اكبر من الناتج من وقود الديزل في خطوة واحده الاسترة الحفازة 53%.

تم تحليل عينات للتعرف علي الناتج.

Abstract

In this work studies were carried out to produce biodiesel from crude *Jatropha Curcas* oil has high free fatty acid content. Due to its high free fatty acid content, the crude *Jatropha Curcas* oil was processed in two steps. During the first step the free fatty acid content of Crude *Jatropha* Oil was reduced to less than 2% in one hour at 60°C using methanol to oil molar ratio and 2% w/w of oil of H₂SO₄. After the reaction, the mixture was allowed to settle for two hours and the top layer of methanol-water mixture was removed. The second step was alkali catalyzed Transesterification using methanol to oil molar ratio of 1:5 and the catalyst to oil ratio of 0.55% w/w to produce biodiesel from the product of the first step at 60°C. The maximum yield of biodiesel was 93% v/v of Crude *Jatropha* Oil which was more than the biodiesel yield (53%) from the one step catalytic Transesterification.

List of Contents

Content	Page No.
Acknowledgement	I
Dedication	II
المخلص	III
Abstract	IV
Table of content	V
Chapter one introduction	
1 Introduction	2
Chapter Two Literature Review	
2.1 Biofuel	3
2.2 Biodiesel	5
2.2.1 Advantage of biodiesel	8
2.2.2 Disadvantage of biodiesel	8
2.3 Jatropha Curcas as feed stock	9
2.3.1 Botanical description	11
2.3.2 Ecology	14
2.3.3 Biophysical limits	15
2.3.4 Products	15
2.3.5 Use as jet fuel	17
2.3.6 Variation in the yield of Jatropha oil	17
2.3.7 Source of Jatropha oil	18
2.4 Method and device for Jatropha oil extraction	19
2.4.1 Mechanical extraction	20
2.4.2 Oil presses	20
2.4.3 Oil expellers	21
2.4.4 Traditional methods	21
2.5.1 Biodiesel production	22
2.5.2 Biodiesel chemistry	23
3. Material and method	
3.1 Material needed	26
3.3 Experimental procedure	26
3.3.1 oil extraction	26
3.3.2 single steps alkali Transesterification	26
3.3.3 two step acid base catalyzed Transesterification	

3.3.3.1 Esterification (pretreatment)	
3.3.3.2 Transesterification	27
3.3.4 Characterization	28
3.3.4.1 Ash content	28
3.3.4.2 Avid value	28
3.3.4.3 Saponification value	28
3.3.4.4 Density	29
3.3.4.5 Flash point	39
3.3.4.6 Cetane number	30
Chapter Four Results and Discussion	
3.1 Results	33
3.2 Discussion	34
Chapter Four Conclusion and recommendations	
4.1 Conclusion	36
4.2 Recommendations	36
Reference	37

LIST OF TABLE

Content	Page no
2.1 Analysis of Jatropha Curcas seed	19
2.2 Fatty acid composition	22
4.1 Chemical and physical characteristic of Jatropha oil	33
4.2 physical properties of biodiesel	33
4.3 Chemical composition of biodiesel	34