

بسم الله الرحمن الرحيم

قال تعالى :

(إن الأبرار يشربون من كأس كان مزاجها كافورا * عينا يشرب بها عباد الله يفجرونها
تفجيرا * يوفون بالنذر و يخافون يوما كان شره مستطيرا * و يطعمون الطعام على حبه
مسكينا و يتيما و أسيرا * إنما نطعمكم لوجه الله لا نريد منكم جزاء و لا شكورا * إنا نخاف
من ربنا يوما عبوسا قمطريرا * فوقاهم الله شر ذلك اليوم و تقاهم نضرة و سرورا * و جزاهم
بما صبروا جنة و حريرا *)

صدق الله العظيم

الإنسان الآية (5-12)

DEDICATION

To my parents, brothers and sisters

To Dr.AbdelfatahBellal ,Dr.HazirFarouq and
Dr.AliHamdan for their support and protection

To myBrotherswho stand behind me

ACKNOWLEDGMENT

Praise is to *ALLAH*, the almighty who graciously favored us to get over this work and enable us to accomplish this achievement.

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ABSTRACT

In this research a biodiesel production reactor is developed and fabricated in production workshop located in Mechanical engineering school (SUST) using available material in the workshop. The performance of the reactor is evaluated by using Soybean oil to produce biodiesel in the presence of Methanol as alcohol and sodium hydroxide as a catalyst, according to proposed operation procedure the experiments is conducted in the reactor and biodiesel is produced in adequate amount (4 liters of biodiesel from 4.5 liters of oil) addition to glycerine and soap as by-product.

الملخص

في هذا البحث تم تطوير وتصنيع معالج لإنتاجالوقود الحيوي في ورشة الإنتاج بمدرسة الهندسة الميكانيكية بجامعة السودان للعلوم والتكنولوجيااستخد ام المواد المتاحة في الورشة ثم تم تقييم أداء الجهاز باستخدام زيت الفول لإنتاج الوقود الحيوي في وجود الميثانول وهيدروكسيد الصوديوم ، وفقا لطريقة العمل المقترحةتم الحصول علي المنتج المطلوب بكمية مناسبة (4 لتر وقود حيوي من 4.5 لتر زيت) بالإضافة الي الجلسرين و الصابون كمنتجات ثانوية.

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LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviation	Meaning
ASTM	American Society for Testing and Materials
ASTM D6751	American Standard Specification for biodiesel
AV	Acid Value
B10	10 % Biodiesel +90 % Diesel
B20	20 % Biodiesel +80 % Diesel
B30	30 % Biodiesel +70 % Diesel
B50	50 % Biodiesel +50 % Diesel
B100	100 % Biodiesel
CJCO	Crude JatrophaCurcas Oil
DIN	German Institute for Standardization)
EN14214	European Standard Specification for biodiesel
FAME	Fatty Acid Methyl Esters
FFA	Free Fatty Acid
H ₂ SO ₄	Sulphuric Acid
KOH	Potassium Hydroxide
MeOH	Methanol

NaOH

Sodium hydroxide