



Contents lists available at ScienceDirect

Materials Today: Proceedings

journal homepage: www.elsevier.com/locate/matpr

A review on bioenergy and biofuel production

Anna Raj Singh^a, Sudhir Kumar Singh^a, Siddharth Jain^{b,*}^a School of Mechanical Engineering, Galgotias University Greater Noida, Uttar Pradesh 203201, India^b Department of Mechanical Engineering, College of Engineering Roorkee, Roorkee 247667, India

ARTICLE INFO

Article history:

Available online xxxx

Keywords:

Biodiesel
Heterogeneous catalyst
Homogeneous catalyst
Nanocatalyst

ABSTRACT

The use of natural resources in the production of diesel has led to the increase in the prices and main concern is to focus towards the bio energy to reduce the percentage of pollution level in various reigns of the globe. New type of energy resources like from wind energy, nuclear energy and solar been used to make energy efficient fuel which can be recycled easily and can be reused again. Biofuel serve as the best source of energy as they are cheaper in synthesis. To make production of biofuel by transesterification process more efficient choosing a suitable catalyst plays very significant role. Homogenous catalyst is been performed by various authors, it is been observed that the reusability and recyclability is complicated and expensive. Heterogeneous type catalysts provide efficient yielding results and can be reused again. The work towards the Nano catalyst over the production of biofuel has been done to a limited extent. The exploitation of Nano catalysts, at the boundary between homogeneous and heterogeneous catalyst, provides modern efficient methods to develop energy efficient biofuels.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Advancement in Materials, Manufacturing and Energy Engineering (ICAMME-2021).

1. Introduction

Bioenergy is one of the diverse resources available to fulfill the demands of the energy requirement. The bioenergy produced from the organic materials such materials are referred as biomass. The development of bioenergy with the use of algae been performed to large extent. The energy received has wide application in electricity and biofuels. On global application the bioenergy provides about 10% of the energy supplies in the form of thermal energy for heating and cooking. For bioenergy the biomass sources includes animal, plants, agriculture, algae and industrial waste. Methods of bioenergy production always depends upon the methods we follow and on the type of biomass been used in the development of bioenergy [1–9]. The biomass conversion can be done with gasification, pyrolysis, conventional combustion and anaerobic digestion. The use of second generation as lignocellulosic biomass is very suitable in the synthesis of biofuel. The application of biodegradable feedstocks the overconsumption of natural fossil fuels can be reduced. The use of Trans esterified form of oil is been used to avoid the breakdown of the diesel engines [10–19].

2. Biofuel production across countries

According to the survey in the year 2018 almost 2616 thousand barrels/day were produced in the world. US and Brazil has a production rate of 87% of the world population. The biogas production rate is estimated 1890 thousand barrels per day in case of biodiesel production was 702 thousand barrels per day. The US in the year of 2018 has a leading rate in biofuel production which is 1190.2 thousand barrels per day. The contribution rate was 45.5% for biofuel, 55.4% for bio gasoline and 19.4% for biodiesel. The production of fuel ethanol and soya bean is done by using primary feedstock which is corn [Fig. 1]. The Palm oil production rate for the biofuel is done in Indonesia and Malaysia. The Second leading country in the biofuel production after US is Brazil which had production rate of 693.2 thousand barrels per day in the year 2018. The share rate of Brazil is around 31.5% which is about 595.25 thousand barrels per day for bio gasoline. For the biodiesel the share rate is estimated 14.1% (99,000 barrels per day). The production rate of ethanol in Brazil been increased to 9% (28.72 billion liters). Germany stands at third position in the biofuel production which is 75.8 thousand barrels per day. 3.2 millions of tons of biodiesel production is done in the year 2018 with the use of rapeseed and cooking oil. Argentina reported 70.6 thousand barrels per day with total capacity of 2.7% making it at fourth position across the globe. The coun-

* Corresponding author.

E-mail addresses: siddharthajain@coer.ac.in, arthjain2001@gmail.com (S. Jain).<https://doi.org/10.1016/j.matpr.2021.03.212>

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