Advances in Biological Science Research

A Practical Approach

Edited by
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Chapter 16

Trends in production and fuel properties of biodiesel from heterotrophic microbes

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16.1 Introduction

Biodiesel, a renewable energy source, is rapidly emerging as an alternative fuel for conventional petrodiesel. It has been estimated that approximately 22% of the total greenhouse emissions arise due to the use of fossil transport fuels [1]. One-fifth of the total CO_2 released is due to the use of transport fuels, and hence the use of alternative, renewable fuels like biodiesel is recommended. Biodiesel offers many advantages like miscibility with petrodiesel, reduction in exhaust emissions, higher flash point, inherent lubricity, high energy return, low content of sulfur and phosphorus, a high cetane number, and ease in biodegradability [2].

In the transport sector, global biofuel production increased by 2.5% in 2017 compared to the previous year. The United States registered a 1.6% increase in biodiesel production with 6 billion liters and was the largest producer of this renewable fuel. Brazil was the second largest producer with a total production of 4.3 billion liters, a 13% increase. Germany, which produced 3.5 billion liters, was the largest biodiesel producer in Europe. Argentina produced 3.3 billion liters, followed by Indonesia with a production of 2.5 billion liters. Biodiesel commands a share of 29% in the liquid biofuel market. The total production of biodiesel was 36.6 billion liters in 2017, which was a 1% increase compared to 2016 [3]. In India, 150 million liters of biodiesel was produced in 2017 and another 10 million liters would be added in 2018 [4]. The European Union (EU) has specified that every member country should derive 20% of its energy requirement from biofuels and 10% of its transport fuel should be obtained from renewable sources [5]. Biodiesel production is expected to increase every year by 4.5% to reach 41 billion liters in 2022 [6].

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