

## **A Short Review on Catalyst, Feedstock, Modernised Process, Current State and Challenges on Biodiesel Production**

### **ABSTRACT**

Biodiesel, comprising mono alkyl fatty acid esters or methyl ethyl esters, is an encouraging option to fossil fuels or diesel produced from petroleum; it has comparable characteristics and its use has the potential to diminish carbon dioxide production and greenhouse gas emissions. Manufactured from recyclable and sustainable feedstocks, e.g., oils originating from vegetation, biodiesel has biodegradable properties and has no toxic impact on ecosystems. The evolution of biodiesel has been precipitated by the continuing environmental damage created by the deployment of fossil fuels. Biodiesel is predominantly synthesised via transesterification and esterification procedures. These involve a number of key constituents, i.e., the feedstock and catalytic agent, the proportion of methanol to oil, the circumstances of the reaction and the product segregation and purification processes. Elements that influence the yield and standard of the obtained biodiesel encompass the form and quantity of the feedstock and reaction catalyst, the proportion of alcohol to feedstock, the temperature of the reaction, and its duration. Contemporary research has evaluated the output of biodiesel reactors in terms of energy production and timely biodiesel manufacture. In order to synthesise biodiesel for industrial use efficaciously, it is essential to acknowledge the technological advances that have significant potential in this sector. The current paper therefore offers a review of contemporary progress, feedstock categorisation, and catalytic agents for the manufacture of biodiesel and production reactors, together with modernised processing techniques. The production reactor, form of catalyst, methods of synthesis, and feedstock standards are additionally subjects of discourse so as to detail a comprehensive setting pertaining to the chemical process. Numerous studies are ongoing in order to develop increasingly efficacious techniques for biodiesel manufacture; these acknowledge the use of solid catalytic agents and non-catalytic supercritical events. This review appraises the contemporary situation with respect to biodiesel production in a range of contexts. The spectrum of techniques for the efficacious manufacture of biodiesel encompasses production catalysed by homogeneous or heterogeneous enzymes or promoted by microwave or ultrasonic technologies. A description of the difficulties to be surmounted going forward in the sector is presented.