

A review on microwave-assisted production of biodiesel

Abstract

Energy is the most important necessity for human existence on the earth. Limited crude petroleum resources and increasing awareness regarding the environmental impacts of fossil fuels are driving the search for new energy sources and alternative fuels. Biodiesel is a fuel which is renewable, biodegradable, environmentally friendly, and non-toxic in nature and has attracted considerable attention during the past decades. The costs of feedstock and the production process are two major hurdles to large-scale biodiesel production in particular. Various technologies have been developed to reduce the production cost. This paper attempts to extensively review microwave-assisted technology for biodiesel production. Additionally, different types of feedstocks for biodiesel production have been summarized in this paper. It is concluded that the microwave-assisted technique reduces the reaction time significantly in comparison with conventional methods. In addition, a high quality biodiesel can be obtained from microwave-assisted transesterification of different kinds of oils. Finally, the energy payback for 1kg biodiesel produced by microwave-assisted technology is calculated in this paper and it indicated that the system is sustainable. Therefore it can be a suitable method of decreasing the cost of biodiesel and can also help the commercialization of this fuel.