How Refinery Industry Waste (Spent Bleaching Clay/Earth) Related to the Energy Fuel Demand: 

A Review

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Abstract

Biodiesel is an extender for traditional petroleum diesel and can be defined when the color show slightly yellow, oily liquid with a slight aromatic odor and a bitter taste. Commonly used as fuel for stationary diesel engine like pump sets, other agricultural implements and also in the diesel car. Realizing the importance of alternative energy sources, this research had come out with cost effective and versatile method for biodiesel preparation. In this research, the raw material feedstock had been taken from the refinery palm oil waste called spent bleaching clay. Refinery industry waste usually was dumped into landfill and cause environmental problems. This waste called spent bleaching clay. It is about 20-40 wt. % oil remains in spending bleaching clay which are taken from palm oil refinery. The transesterify between the oil and methanol can convert the oil into an alternative to fossil diesel fuel. This review had lined up all the transesterification method, the conversion yield, catalyst and other applications. The prospective of refinery waste will cover the future of biodiesel using waste as cost effective feedstock.

Keywords: Waste; Spent bleaching clay; Transesterification; Biodiesel; Feedstock

1. Introduction

In this century, the depletion of petroleum based diesel gives major impact for industry and human itself. The alternative energy fuel had been discovered and one of them called biodiesel. Biodiesel or fatty acid methyl ester found to be the best substitute for petrol-diesel because it has many benefits. The benefits covered the lower toxic emission, biodegradable, excellent lubricity, carbon neutral and environmental friendly [1]. In industry, the oil (triglyceride) was subjected to the transesterification process to produce biodiesel. This triglyceride reacts with methanol by one mole of triglycerides react with three moles of methanol to produce three moles of methyl ester and one mole of glycerol. This reaction takes same reaction condition with suitable parameters to get the excellent methyl ester conversion. Other than to mention before, the feedstock selection is very important to maintain this alternate energy fuel production. Spent bleaching clay (SBC) or spent bleaching earth (SBE) from any refinery industry can be used as feedstock. The SBC from palm oil refinery industry contains 17% to 35% of residual oil, metallic impurities and other organic compounds [2]. As a byproduct from refinery industry, people usually dump into landfill and caused environmental issue. Bleaching clay dosage of 0.5-1% is usually used for crude palm oil refineries. In Malaysia, estimated about 150 000 tonnes or more of clay utilized yearly in the refining palm oil industry (based on 19 million tonnes of palm oil production yearly) (MPOB). The remaining oil retained in SBC