Green biofuel production via catalytic pyrolysis of Waste Cooking Oil using Malaysian Dolomite catalyst

ABSTRACT

Malaysian Dolomite has shown potential deoxygenation catalyst due to high capacity in removing oxygen compound and produce high quality of biofuel with desirable lighter hydrocarbon (C8-C24). The performance of this catalyst was compared with several commercial catalysts in catalytic pyrolysis of Waste Cooking Oil. Calcination at 900 °C in N2 produced catalyst with very high activity due to decomposition of CaMg(CO3)2 phase and formation of MgO-CaO phase. The liquid product showed similar chemical composition of biofuel in the range of gasoline, kerosene and diesel fuel. Furthermore, Malaysian Dolomite showed high reactivity with 76.51 % in total liquid hydrocarbon and the ability to convert the oxygenated compounds into CO2, CO, CH4, H2, hydrocarbon fuel gas, and H2O. Moreover, low acid value (33 mg KOH/g) and low aromatic hydrocarbon content were obtained in the biofuel. Thus, local calcined carbonated material has a potential to act as catalyst in converting waste cooking oil into biofuel.

Keyword: Malaysian Dolomite; Base catalyst; Waste Cooking Oil; Catalytic pyrolysis; Biofuel