Influence of minerals in crude glycerol from biodiesel production on products distribution of bio-oil via co-pyrolysis with palm oil residues

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Abstract: Palm oil is a major feedstock for biodiesel industries in Thailand. According to AEDP2015, the need of biodiesel will be increased to 14 ML/D in 2036. Generally, 10%wt of crude glycerol is obtained from transesterification process which can be further caused of industrial waste in the future. Also, a large amount of palm residues have been generated in the palm oil industry. Both crude glycerol and oil palm residues are interestingly utilized as feed to produce biofuel or biochemical via fast pyrolysis. The effect of mineral remained in crude glycerol was investigated by using Py-GC-MS. In this study, the model compound, a mixture of mineral with commercial glycerol, was co-pyrolyzed with palm residues. The products obtained from the experiment contained a verity of volatile hydrocarbons. From the results of glycerol pyrolysis without palm residue, a high percentage of mineral effected to increase volatile products which were alcohol, ketone, aldehyde and small alcohol. But the remaining glycerol was decreased dramatically (from 97.24 to 42.48 %) at a high % of mineral. In case of the glycerol model in co-pyrolysis with palm residues, the amount of phenolic compound was apparently increased from 16.3% to 47.9%.

Keywords: Pyrolysis; Glycerol; Biodiesel; Bio-oil; Palm residue