SEWAGE SLUDGE CHARACTERIZATION AND PYROLYSIS

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ABSTRACT

In this study, treated sewage sludge from Indah Water Pantai Dalam and Kolej Mawar waste water treatment plant were characterized for pyrolysis application to generate product oil for bio-fuel. The characterization analyses of sample were carried out according to the American Test Method (ASTM). Based on the proximate and ultimate analysis data, both samples has a calorific value around 11±1 MJ/kg, ash content lower than volatile matter and low fixed carbon value, where sample from IWK Pantai Dalam was has the higher volatile matter and lowest ash content. Previous research was concluding that high volatile matter content with low ash content was the main criteria for pyrolysis. Based upon the fact, the pyrolysis of sample from IWK Pantai Dalam was performed in a flash pyrolysis reactor with four difference temperature 400°C, 500°C, 600°C, and 650°C. At temperature of 600°C the liquid oil yield was maximum (28.48 wt %) and afterwards began to decline. The liquid oil produce is alkali solution with high density and valuable calorific value. The liquid oil obtained at temperature 600°C was analyzed for its chemical compound by using FTIR and GC_MS. Result showed that liquid oil contain a high proportion of alkane, alkene, and aromatic compounds that would be interesting in order to use the bio-oil in bio-fuel applications.