

Bio-Oil Production and Chromatographic Characterization from the Pyrolysis of Oil Palm Empty Fruit Bunches

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Abstract : Oil palm empty fruit bunches, derived biomass available in Indonesia, is one of the potential biomass to produce biofuels like bio-oil due to its abundant supply and favorable physicochemical characteristics. An interesting alternative of utilising the oil palm empty fruit bunches is in the production of bio-oil by pyrolysis. Pyrolysis of oil palm empty fruit bunches to bio-oil is being considered for national energy security and environmental advantages. The aim of this study was to produce bio-oil by pyrolysis of oil palm empty fruit bunches at various temperature and observe its detailed chemical composition. The biomass was submitted to a pyrolysis in a batch reactor. Experiments were carried out at a temperature range of 450-600°C and heating rate range of 10-20°C/min. The yield of bio-oil was found to be maximum at the temperature of 600°C. The bio-oils detailed compositions were investigated using FTIR and GC-MS. The bio-char produced as a co-product can be a potential soil amendment with multiple benefits including soil fertility and for solid fuel applications that also contributes to the preservation of the environment. The present investigation suggests the suitability of oil palm empty fruit bunches as a potential feedstock for exploitation of energy and biomaterials through pyrolysis process.

Keywords : bio-oil, oil palm empty fruit bunches, pyrolysis, renewable energy

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