



Recycling of Wood Bark of *Azadirachta indica* for Bio-oil and Chemicals by Flash Pyrolysis

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Abstract: In this study, flash pyrolysis of wood bark of neem tree (*Azadirachta indica*) was examined with an aim to analyze the effect of process parameters on pyrolysis yield, physical and chemical characteristics of bio-oil produced to determine its viability as a commercial fuel as well as chemical feedstock. Flash pyrolysis of wood bark was done in a laboratory scale fluidized bed reactor at a temperature ranges from 350 to 550 °C, different particle sizes from 0.71 to 1.25 mm with a sweep gas flow rate of 1.25 to 2.25 m³/hr. The maximum yield of pyrolysis bio-oil of 49.5wt% was obtained under the pyrolysis temperature of 450 °C, 1.0 mm particle size and at the sweep gas flow rate 2 m³/hr. The FT-IR and GC-MS analysis of the bio-oil indicates that it mostly consists of phenolic and oxygenated compounds with alkanes, alkenes, ketones and carboxylic acids. Chromatographic studies on the bio-oil confirmed that the oil derived from neem wood bark can be used as a renewable fuel having calorific value of 22.7 MJ/kg and its elements can be used as valuable feedstock for chemical industries.

Keywords: Wood bark, *Azadirachta indica*, pyrolysis, fluidized bed, bio-oil, characterization
