POTENTIAL OF *Leucaena leucocephala* WOOD AS A SOURCE OF RENEWABLE ENERGY

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ABSTRACT

POTENTIAL OF *leucaena leucocephala* WOOD AS A SOURCE OF RENEWABLE ENERGY

The physical and thermochemical effect of age and tree sections on calorific value, ash content, specific gravity and moisture content of *Leucaena leucocephala* wood and oil palm trunk was investigated. *Leucaena leucocephala* wood and oil palm trunk were taken from Tawau, Sabah and Jengka 24 respectively. The investigation was made on sample *Leucaena leucocephala* trees taken from age of 1 year, 2 years and 3 years while the oil palm trunk aged 24 years. The samples of *Leucaena leucocephala* were taken from top, middle and bottom sections of the tree for 2 year-old tree. Sampling is carried out according to the standard Technical Association of the Pulp and Paper Industry USA (TAPPI, 1996). Calorific values of *Leucaena leucocephala* were determined from 2 year-old tree sample taken from top, middle and bottom. The calorific value was measured using bomb calorimeter. Ash content, specific gravity and moisture content were determined using the conventional method. The calorific value and ash content of oil palm trunk were also determined on sample from top, middle and bottom section. The result showed that, there was a marginal increase in the calorific value with the ages for *Leucaena leucocephala.* The calorific value of *Leucaena leucocephala* wood was found to be higher for 3 year tree and decreased to lower ages, the values being significant for 1 year tree. The ash content in general was found to be higher for 3 year. However it was found to be not significant and there was no particular trend observed. For the 2 year-old *Leucaena leucocephala* the calorific value was found to be higher at the bottom. It increased along the height from top to bottom. However the ash content of *Leucaena leucocephala* decreased from bottom to top. The trend for specific gravity was similar to calorific value where they increase from top to bottom. The calorific value and ash content for *Leucaena leucocephala* is then compared to Oil Palm trunk according to tree sections. The comparison result showed that the calorific value of *Leucaena leucocephala* was higher than the oil palm trunk which gives 19% IN different. The ash content of *Leucaena leucocephala* however was lower than that of the oil palm trunk. *Leucaena leucocephala* has a great potential to be an alternative renewable energy source in this region.

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