

Aujchariya Chotikhun 2009: Effects of Closer Wood Charcoal Kiln at Various Carbonization Temperature on Properties of Charcoal. Master of Science (Forestry), Major Field: Forest Products, Department of Forest Products. Thesis Advisor: Assistant Professor Nikhom Laemsak, Ph.D. 58 pages.

The research on effects of closes wood charcoal kiln at various carbonization temperature on properties of charcoal were studied the manufacture and properties of charcoal at 3 level carbonization temperature i.e. 500, 600 and 700 °C. The charcoal kilns were made by Thai-Iwate kiln (Japanese type) using Eucalyptus (*Eucalyptus camaldulensis*) wood. Those woods, were 3-5 years old with diameter 1.5-4 inches and air-dried approximately 4 weeks (moisture content less than 40 %).

The results revealed that charcoal properties, i.e. charcoal yield, moisture content, fixed carbon, volatile matter, ash content, heating value and density and wood vinegar properties, i.e. wood vinegar yield, specific gravity, pH, color, smell and transparent. In addition, the results showed the charcoal making cycle consumed (inner volume of the kiln 12 m³) 15 days with average 5,607 kg of wood. The properties of charcoal were divided into two parts, i.e. top and bottom part of the kiln. All the temperature closer kiln, top part charcoal had fixed carbon and heating value higher than bottom part. At closer temperature 700 °C, top part charcoal, had highest value of fixed carbon and heating value 82.0 % and 7,480 kcal/kg, respectively. Statistical analysis using statistical package, analysis of variance and multiple comparison of Duncan's Multiple Range Test (DMRT), showed that all closer temperature of top part charcoal not significant different on properties of charcoal. Bottom part charcoal, all closer temperature, had significant different on fixed carbon and heating value. The mean of group at least had one pair different. Multiple comparison showed that the charcoal properties at closer temperature 500 °C and 700 °C were differed. Other properties of bottom part of the kiln charcoal were not significantly different. The charcoal making in this research should be choosed closer temperature 700 °C to get high quality charcoal as higher heating value and fixed carbon and low volatile matter.

Student's signature

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