The Preliminary Study of Two-Stage Pyrolysis Durian Shell to Biochar

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Abstract:

Pyrolysis technology is a thermochemical process that can be used to produce useful products from biomass, such as biochar, bio-oil and combustible pyrolysis gases. Durian is a significant economic fruit in Thailand that continuous increase in durian consumption has led to a massive amount of waste from processing is durian shell. This research focuses on the production of biochar from durian shell using a two-stage pyrolysis process. The primary aim is to manage two types of waste: durian shell and flue gases, at a temperature of 500°C with various time (1-5 hours). The biochar was characterized by SEM, FTIR, XRF, BET analysis, and its high carbon content determined by proximate analysis. The result found that after heating durian shells turned into black color which 70.51% carbon, heating value is 6,385.32 kcal/kg. Moreover, surface area, pore volume, and pore size of 74.20m2/g, 0.13 cc/g, and 0.005 mm., respectively. The results from this research can encourage developing different approaches towards making use of food waste (durian shell) and flue gases to Value-added materials (biochar) by two-stage pyrolysis process.