

Physicochemical Characterization of Waste from Vegetal Extracts Industry for Use as Briquettes

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Abstract : Wastes from a vegetal extracts industry (cocoa, oak, Guarana and mate) were characterized by particle size, proximate and ultimate analysis, lignocellulosic fractions, high heating value, thermal analysis (Thermogravimetric analysis – TGA, and Differential thermal analysis - DTA) and energy density to evaluate their potential as biomass in the form of briquettes for power generation. All wastes presented adequate particle sizes to briquettes production. The wastes showed high moisture content, requiring previous drying for use as briquettes. Cocoa and oak wastes had the highest volatile matter contents with maximum mass loss at 310 ºC and 450 ºC, respectively. The solvents used in the aroma extraction process influenced in the moisture content of the wastes, which was higher for mate due to water has been used as solvent. All wastes showed an insignificant loss mass after 565 °C, hence resulting in low ash content. High carbon and hydrogen contents and low sulfur and nitrogen contents were observed ensuring a low generation of sulfur and nitrous oxides. Mate and cocoa exhibited the highest carbon and lignin content, and high heating value. The dried wastes had high heating value, from 17.1 MJ/kg to 20.8 MJ/kg. The results indicate the energy potential of wastes for use as fuel in power generation.

Keywords : agro-industrial waste, biomass, briquettes, combustion

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