

2nd International Congress and Expo on**Biofuels & Bioenergy**

August 29-31, 2016 Sao Paulo, Brazil

Characterization of sugarcane bagasse produced in the central region of São Paulo state in Brazil

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The sugarcane bagasse characterization is an essential issue for the adequate design and implementation of fluidized bed technologies that use this biomass as feedstock. This work presents the determination of the main physical, chemical and geometrical properties of bagasse particles of sugarcane collected at the central region of São Paulo in Brazil. The characterization techniques used, were the commonly used for other particles. The granulometric characterization was made by sieve techniques; the determined characteristic mean diameter for this biomass was 0.722 mm. Also was carried out the proximate analysis, for determining the content of moisture, ash, volatile matter and fixed carbon. In the case of the ash content, the obtained value was $3.56 \pm 0.82\%$; slightly higher than values previously reported by others authors. The gross calorific value and the real, apparent and bulk densities were determined. The geometric characterization was made through two important factors: the aspect ratio (AR) and sphericity. The shapes of the particles were studied by manual and through images analysis method, using the ImageJ software. Was observed that sugarcane bagasse particles have a larger length than the others analyzed biomasses with almost a similar width. The aspect ratio was in the range of 3.922 ± 2.736 . For particles with diameters lower than 0.3 mm, the aspect ratio have a similar comportment than the others biomasses with a reporter value of 2.5. The obtained sphericity for the sugarcane bagasse was 0.397.

Biography

Nestor Proenza Pérez, Mechanical Engineer, MSc, has completed his graduation at the University of Camaguey in 2003. He is working as an Assistant Professor in the Department of Mechanical Engineering at the same university since September of 2012. He has completed his Master's in Energy Efficiency and PhD fellow at Laboratory of Optimization of Energy Systems (LOSE) in Sao Paulo State University (UNESP). His research areas include gasification, fluidized bed system, bioenergy, and fluid mechanics systems. He has published several papers in reputed journals and in congress proceedings, and has been serving as an Editorial Board Member of several journals.

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