

Characterization and preparing of rice husk briquettes aiming energetic use

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The biomass application as a fuel in energy conversion process is one of the main alternatives for fossil fuels. In that way, agricultural wastes can be applied as energetic sources, without competing with the planted area for food. The knowledge of biomass physical, chemical and thermodynamical properties is essential for equipment design and for setting the process conditions, looking for an efficient energetic use of biomass. By this way, the main objective of this work was to study the physical properties of rice husk, when it was submitted to different preprocessing conditions and its effects on briquettes production process. The rice husk was characterized through proximate analysis and physical properties. In order to produce briquettes, the effect of moisture content on physical properties and size reduction tests of rice husk was evaluated. The size reduction experiments were carried through in the presence of sieves MESH 10 and 20 for moisture contents of 5, 10 and 15%. After that, samples of grinded (MESH 10) and whole rice husk, with moisture contents of 5, 10 and 15%, were compacted in a hydraulic press. The load over the biomass was controlled until the maximum value of 450 kN. The proximate analysis of the rice husk resulted nearly 66.01% of volatile material, 15.15% of fixed carbon and 18.43% of ash. The high heating value of whole rice was of about 14.424 MJ/kg. The briquette production process with grinded rice husk presented good results for all moisture contents. However, it was not possible to compact the whole rice husk with a load of 45t without the presence of some agglutinative compound. Between all the briquettes produced, those made with grinded rice husk and 10% of moisture content showed the best results, once they presented the lowest energy requirement production, compared with briquette heating value.

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Keywords: agricultural wastes; rice husk; briquetting; physicochemical properties; thermochemical conversion

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