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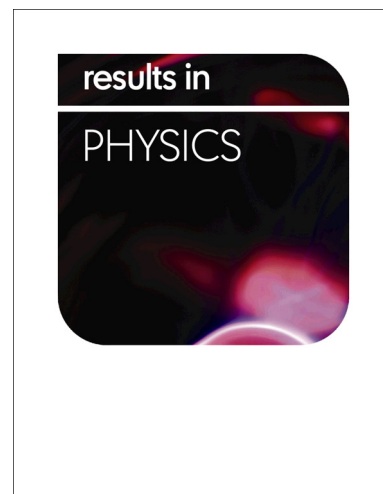
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Physical Properties and Pyrolysis Characteristics of Rice Husks in Different Atmosphere

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Abstract

This paper explores the physical properties and pyrolysis characteristics of rice husk combustion in air and in argon. The SEM results show that the outer epidermis of combusted RHIR (rice husk in air) is well organized with features that include papillae shapes and full, straight, high ridges. The inner epidermis of the RHIR has long rectangular furrow tissues. The results also show that the outer epidermis of pyrolyzed RHR (rice husk in argon) has ridges that are not as straight as for the RHIR and the top of the papillae have small holes. The inner surface of the RHR looks a little cracked. XPS analysis shows that the surfaces of RHIR and RHR contain carbon, oxygen, and silicon. The carbon was found to be in the elemental graphite form, the oxygen in the -2 oxidation state, and the silicon in the Si^{4+} form as SiO_2 . The DSC graphs have "camel peaks", showing that an increase in rate of heating leads to an increase in the exothermic peaks. Calculations show that, initially, increased temperature leads to increased activation energy for pyrolysis, but as the temperature continues to increase, the activation energy decreases again. The frequency factor follows the same trend. In analysis of carbon content, rice husk volatile carbon content is the largest, it is about 33.94%, especially 700 °C, the carbon content of

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