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The Potential of Selected Agricultural Wastes Fibers as Acoustic Absorber and Thermal Insulator Based on their Surface Morphology via Scanning Electron Microscopy

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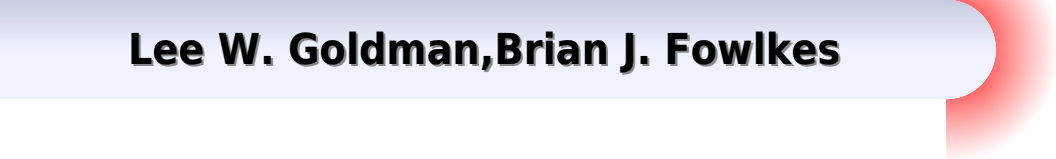
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ABSTRACT

Natural fibrous materials have been studied to address noise and high heat indices, but many of the existing studies about natural fibers do not sufficiently support their claims of better acoustical and heat insulating materials. Thus, this study investigated the surface morphology of easily available agricultural materials such as coconut husks, banana pseudostem and sugarcane husk for their potential as sound absorbers and thermal insulators. Fiber pads from the materials were constructed and analyzed for noise reduction coefficients, thermal insulating performance, water absorbing capacity and flame tolerance - using the methods specified in the American Society for Testing Materials. Herein, scanning electron microscopy (SEM) was applied for analytical imaging of the agricultural materials. Noise reduction coefficients (0.80 dB and 0.92 dB), (0.75 dB and 0.78 dB) and (0.50 dB and 0.35 dB) each at 800 Hz and 440 Hz, and heat reductions of 2.56 °C, 1.71 °C, and 1.24 °C were obtained from coconut husk, sugarcane husk and banana pseudostem, respectively. The coconut husk also gave the highest water absorbing capacity and high flame tolerance of 56%, compared to that of sugarcane husk (49%) and banana pseudostem (32.67%). The morphology of the coconut husk, after SEM application revealed more diverse microporous cells with varying shapes and sizes compared to that of sugarcane husk and banana pseudostem. Thus, results indicate that porosity affects the noise and heat reduction indices of the fibers. The more porous the material is, the better its potential as sound absorber and thermal insulator.

Selected Papers On Scanning Acoustic Microscopy

Lee W. Goldman, Brian J. Fowlkes



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In a global defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their ability to kindle emotions, provoke contemplation, and ignite transformative change is really awe-inspiring. Enter the realm of "**Selected Papers On Scanning Acoustic Microscopy**," a mesmerizing literary masterpiece penned by way of a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve in to the book is central themes, examine its distinctive writing style, and assess its profound effect on the souls of its readers.

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