

Abstract

In the study, application possibility of lingocellulosic fibers of cow manure and also compared to wheat straw fiber for making wood plastic (WPC) composites were studied in two separate stages. The first stage of this research, the physical and mechanical properties of Lingocellulosic fibers of cow manure with Nanoclay were studied. For this purpose, lingocellulosic fibers of cow manure washed and prepared, and then, these fibers were combined with polyethylene low density, and Nanoclay. The control sample of polyethylene and another sample with 48% polyethylene, 2% maleic anhydride and 50% of manure fibers were combined to polymer sample. Other treatments are included 2% Nanoclay, 2% maleic anhydride, 26%, 36%, 46% polyethylene and 50%, 60%, 70% lingocellulosic fibers of cow manure. Then, Nano Composites were made by injection molding, and mechanical tests such as flexural strength, tensile strength, accomplished and also, physical properties including of water absorption and thickness swelling according to the standard ASTM (Regulations No. D790, D638 and D7031) were performed for samples. The results showed that the tensile strength and flexural increasing by content fiber, up to 60% level and then decreased. Also modulus elasticity flexural, tensile, water absorption and thickness swelling increasing by the fiber content increase. strength of samples are more than sample without Nanoclay. In general, elasticity modulus of flexural and tensile specimens are more than control samples, but they have less resistance to bending and stretching. Scanning electron image shows fibers Lingocellulosic of cow manure can be effective in reducing the composite strength, because of, very weak cell-wall and atrophied at temture. But the second stage of this study, resulted determining of the physical and mechanical properties of polymer composite boards, cow manure fibers and wheat straw. for this purpose, digested fiber of cow manure and wheat straw were mixed based of three levels of 30, 40, and 50% (fillers), with lightweight polyethylene powder. 2 % maleic anhydride as a coupling agent was used at all levels, and then, these materials were made by flat press. The results showed that the flexural strength, modulus of elasticity, tensile strength and modulus of elasticity were increased by increasing the amount of fiber. While tensile strength and impact resistance reduced, water absorption and thickness swelling increased by increasing fiber content for 2 and 24 hours. In this study, the rate of water absorption and thickness swelling of samples of wheat straw fibers are more than samples with lingocellulosic fibers of cow manure, but the resistance of composite mechanical in wheat straw was higher than the lingocellulosic fibers of cow manure.

Keywords: Polymer composite, manure fibers, polyethylene, Nanoclay, physical and mechanical properties, Scanning electron image.



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Wood and Paper Science and Technology

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**Apply effect of digestion lignocellusic fibers by system of ruminants on the physical
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Supervisor:

Dr. A. bayatkashkoli

Advisor:

Dr. M. shamsyan

By:

A. jafari ghalebigh

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