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Mechanical and Physical Properties of Wood Composite Panel from Recycled Plastic and Sawdust of Cordia alliodora (Ruiz and Pav.)

Authors : Ahmed Bolaji Alarape, Oluwatobi Damilola Aba, Usman Shehu

Abstract : Wood plastic composite boards were made from sawn dust of Cordia alliodora and recycled polyethylene at a mixing ratio of 1.5ratio1, 2.5ratio1 and 3.5ratio1 and nominal densities of 600 kilograms per meter cube, 700 kilograms per meter cube, and 800 kilograms per meter cube, The material was hot pressed at 150-degree celsius to produce board of 250 millimeter by 250 millimeter by 6 millimeter of which 18 boards were produced. The experiment was subject to 3 by 3 factorial experiments in Completely Randomised Design (CRD). Analysis of variance and Duncan Multiple Range Test (DMRT) was adopted by 3 by 3 at 5 percent probability. The strength properties of the boards such as modulus of rupture (MOR) and modulus of elasticity (MOE) were investigated, while the dimensional properties of the board such as the water absorption (WA) and thickness swelling (TS) were as well determined after 12hrs and 24hrs of water immersion. The result showed that the mean values of MOE ranged from 9100.73 Newtons per square millimeters to 12086.96 Newtons per square millimeters while MOR values ranged from 48.26 Newtons per square millimeters to 103.09 Newtons per square millimeters. The values of WA and TS after 12hrs immersion ranged from 1.21 percent to 1.56 percent and 0.00 percent to 0.13 percent, respectively. The values of WA and TS after 24hrs of water immersion ranged from 1.66 percent to 2.99 percent and 0.02 percent to 0.18 percent, respectively. The higher the value of board density and the high-density polythene /sawdust ratio, the stronger, the stiffer and more dimensionally stable the wood plastic composite boards obtained. In addition, as the density of the board increases, the strength property of the boards increases. Hence the board will be suitable for internal construction materials.

Keywords : wood Plastic composite, modulus of rupture, modulus of elasticity, dimensional stability
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