

Abstract

This investigation with aim of modified and improve the water resistance of Urea formaldehyde (UF) and Melamine formaldehyde (MF), for using in particleboard production, with help of variable additives to this resins was performed. Content of resin was stable and were considered 10 percent of the wood chips. Additives used in Urea formaldehyde resin include boric acid, seed flour of Safflower, polymerized Melamine, the bees wax, Nano-cellulose, Cotton seed flour and Nano zinc oxide and also additives used for Melamine Urea formaldehyde resin include polymerized Melamine, Nano-cellulose, cotton seed flour and Cassia angustifolia flour by 1 to 4 percent of the dry weight of the adhesive. Pressing time was 5 minutes at 190°C press temperature and press pressure 26 kg/m² was considered. Physical and mechanical properties of particleboard made was performed by using ASTM, D1013-04 standard and by using ANOVA oneway analyze and in mould of completely randomized model at 95% confidence level for statistical analysis was performed. The results showed that the 5 added additive to the urea formaldehyde resin (boric acid, seed flour of Safflower, polymerized Melamine, Cotton seed flour and Nano zinc oxide) with decreasing hydrophilic hydroxyl groups cause the water absorption of particleboard made with these resin were decrease. 2 additives, such as seed flour of Safflower and Cotton seed flour than were better of other additives were caused the decrease of water absorption compared to the control sample at 52/34 percent and 54/57 percent and decrease the swelling compared to the control sample at 49/54 percent and 26/54 percent, respectively. Of course It should be noted that the using of polymerized Melamine in addition to reducing water absorption and swelling compared to the control sample were cause 9/09 percent increase of internal bonding in case of dry, 9 percent in case of boiling water and 77/97 percent in case of after 24 hours immersion in water. Also, polymerized melamine, cotton and Cassia angustifolia flour added to Melamine Urea formaldehyde resin were cause decrease the physical properties of boards compared to the control sample. So as decrease the water absorption compared to the control sample were equal to 20/72 percent, 27/38 percent and 21/56 percent, respectively. And for thickness swelling were reduce at 20/61 percent, 19/26 percent and 15/67 percent, respectively. Adding the cotton seed flour and Cassia angustifolia flour to the Melamine formaldehyde resin, compared to the control sample in addition to decreasing physical properties were cause increase at 8/75 and 21/25 percent in internal bonding in case of dry, 63/64 and 36/36 percent in case of boiling water and 100 percent in case of after 24 hours immersion in cold water, respectively.

Keywords: Urea formaldehyde resin (UF), Melamine Urea formaldehyde (MUF), Physical properties, Mechanical properties.



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**Improvement water resistance of Urea-
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Formaldehyde (MUF) resins**

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