Application of Attapulgite Clay Mineral Modified by Flame Retarder in Green Building Materials

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Abstract	In this thesis, the composite of aluminum hydroxide on the surface of natural one-dimensional nano minerals and the nanocrystallization of inorganic flame retarder (aluminium hydroxide) are achieved by hydrothermal method. The obtained nano-composite flame retarder is applied in the preparation of straw based panel to improve its flame retardant performance. After ultrasonic dispersion and complex purification with the addition of EDTA, the crude attapulgite clay minerals is put in acid solution of PH 2 or 3, where the surface of the complex is modified with the addition of cetyl trimethyl ammonium bromide (CTAB).Then add into it aluminum hydroxide of different amounts, to start the hydrothermal composite reaction and get aluminum hydroxide/ nano-attapulgite composite flame retarder. After the characterization by SEM the best hydrothermal reaction conditions for preparing aluminum hydroxide/attapulgite are obtained. The prepared nano composite flame retarder, the PF adhesive and straw shavings are mixed in different proportions and made into straw based panel by hot pressing. Then the study on the flame retardant performance and the mechanical properties of the straw based panel is carried out.

First page example

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Key words: Straw based panel; flame retardant; nano; attapulgite; aluminium hydroxide

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1.Introduction

Our country is short of timber resources. With the constant rapid development of wood based panel industry, the shortage state of timber raw materials is becoming severer and severer in recent years. As a result, some wood based panel industries are in a state of no production or only half production, and the further development of wood based panel industry is much influenced. At the same time, timber raw materials of poor quality are widely used, causing a big influence in production quality. Under such circumstances, extensive attentions are paid to the technology of manufacturing panel of non-wood raw materials. Among which straw based panel manufacturing technology has been studied for many years both home and abroad, with proper solutions being found to crucial technical problems and gradual perfect in technology and production solution plans. The industrialization of straw based panel manufacture is obviously getting faster.

Now the annual output of straw in our country is very great, something between 600 million and 700 million tons. But because of the great changes in the fuel structure in the countryside, and owing to the substantial decline of manufactures made of straw, a great amount of straw is burned on the side of field and road. The burning smoke causes traffic barriers in highways and aviation,