

Transformations of Carbohydrate Components during Acetylation of *Aspen* Wood with Acetic Anhydride in Presence of Sodium Hydroxide

Natalia G. Bazarnova, Semen V. Khudenko, Aleksandr I. Galotshkin

Altai State University (656099, Barnaul, Russia, Dimitrova,66)

E-mail: bazarnova@chemwood.dcn-asu.ru, fax +7 3852 228575

The products of the acetylation of native carbohydrate containing materials possess thermoplasticity, hydrophobicity and can be used instead of phenol - formaldehyde resins in the composites materials. The properties of the modified products depend on acetylated cellulose, hemicellulose and lignin per cent content. The transformations of carbohydrate component during acetylation of *aspen* wood (AW) in presence of sodium hydroxide were studied in this work.

The air dry sawdust of AW and sodium hydroxide were milled during 15 minutes, then the mixture were treated with acetic anhydride at 110° C. The structure of the products was identified by IR-spectroscopy. The content of bonded acetic acid after saponification of the acetylated products was defined by GL-chromatography.

The acetylated AW was treated with peracetic acid in order to remove lignin. The IR-spectrum of acetylated holocellulose (comprising cellulose and hemicelluloses) contains low - intensive bonds of aromatic component of wood. This fact indicates presence of traces of lignin in the sample. It should be mentioned that acetylated cellulose does not contain lignin. The results of the analysis of *aspen* wood acetates and its components are shown in the table.

Table

Properties of wood acetates and its main components

Duration of synthesis, hours	1	6
Per cent content of bonded acetic acid in the acetate of wood, %	45,8	53,1
Yield of acetylated holocellulose , %	67,1	61,1
Per cent content of bonded acetic acid in the acetylated holocellulose, %	26,9	32,4
Yield of acetylated cellulose, %	45,2	40,1
Per cent content of bonded acetic acid in the acetylated cellulose, %	20,3	23,5

Obtained data show that the acetylation in presence of sodium hydroxide takes place either with aromatic component of wood (lignin) or carbohydrate components (cellulose and hemicellulose).