Jinbo HU

UR BioWooEB (Biomass, Wood, Energy, Bioproducts)

Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)

TA B-114/16, 73 Rue Jean-François Breton

34398 Montpellier Cedex 5, France

GDR Bois 3544

Work Mission Report

02-06/02/2015, LERMAB, Lorraine University

Dear Madam, Dear Sir,

Please find my report concerning the mission done at LERMAB, from the 2nd to the 6th of February 2015.

This work mission was divided into 3 different task, they will be sum up below.

1. Wood impregnation and treatment

Impregnation solutions including Boric acid, tannins, Montmorillonite and resin (hexamine), at different pH were formulated. These different wood treatment formulations were used to treat different pine sapwood wood samples ($50 \times 25 \times 15$ mm^3, L,R,T). The specificity of this treatment step was the use of vacuum followed by pressure, in order to treat fully the pine samples.

The treated pine samples were then cured at 103°C to allow the tannin-boron-montmorillonite network to occur. The samples are then conditioned at room temperature and will be further used for biological evaluation.

2. FT-IR analysis of tannin-boron-hexamine/caprolactam

18 Different combinations of tannin-boric acid-hexamine, with and without caprolactam, at different pH were formulated and cured prior to their analysis by FT-IR.

The different spectra were obtained and discussed with the team of Prof Gérardin, at Lermab.

3. NMR analysis

The solutions of tannin-boric acid-hexamine, with and without caprolactam, at different pH, were analyzed using ^{13}C-NMR.

The different spectra were obtained and discussed with the team of Prof Gérardin, at Lermab.

The chemical analyses using FT-IR and ^{13}C-NMR obtained will be of great interest to explain the mechanisms involved within the created network and its reaction through the wood.

The results obtained during this GDR short term mission will be included in my Ph D thesis.

I remain at your disposal if you request any further information,

Sincerely,