

The first part of this thesis aimed to analyze the chemical composition of sapwood (sW) and heartwood (hW) of stems from *Pinus halepensis* Mill and *Eucalyptus camaldulensis* Dehnh trees grown in the north of Algeria. Extractives were first isolated by Accelerated Solvent Extraction (ASE) and then analysed by Gas Chromatography-Mass Spectrometry (GC-MS). The cellulosic polysaccharide content present in the pre-extracted wood samples was determined with acid hydrolysis and GC. The hemicelluloses content was determined with acid methanolysis and GC. Free monomers were additionally analyzed by GC. The amount of lignin was determined gravimetrically by the Klason lignin method and the acid soluble lignin was determined by Ultra Violet (UV) method. Formic and acetic acids in wood were determined after alkaline hydrolysis and analyzed by High Performance Size Exclusion Chromatography (HP-SEC).

The second objective of this thesis is to investigate the effectiveness of extraction in optimal conditions of galactoglucomannans (GGMs) from *Pinus halepensis* and methylglucuronoxylans (Xylans) from *Eucalyptus camaldulensis* with pressurized hot water extraction for applications like coatings and films in packaging. For this purpose, optimal molecular masses with high yields are required, presenting a serious challenge for hot water extraction processes. The extraction of GGMs and Xylans was carried out in an ASE and the isolation was performed by precipitation in ethanol. Three temperatures and five extraction times were tested in order to optimize extraction parameters, avoiding thermal and chemical degradation in hot water. Total dissolved solids (TDS) were determined gravimetrically after freeze-drying and weight average molar masses ( $M_w$ ) were determined by HP-SEC. Total non-cellulosic carbohydrates were determined by GC after acid methanolysis. Free monomers were additionally analyzed by GC. Lignin in water extracts was measured by a UV method. Acetic acid was determined after alkaline hydrolysis of acetyl groups and analyzed by High-performance liquid chromatography (HPLC). The main parameters influencing the extraction processes of the GGMs and Xylans, namely, extraction time and temperature were studied.

The third part aimed to evaluate different physical and chemical performances of the obtained GGMs for an application like films for food packaging. Experimental results indicate that the GGM/guar gum based films can be used as part of the raw material for films with good oxygen barrier properties and higher functional quality