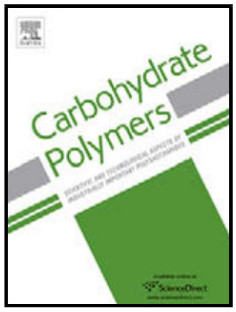

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Effect of autohydrolysis on *Pinus radiata* wood for hemicellulose extraction

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Highlights

- Hemicellulose-derived compounds were obtained from *Pinus radiata* autohydrolysis.
- This treatment produces autohydrolyzed woods with high thermal stability.
- The primary compounds in the liquid phase are presented in oligomeric form.

The extraction of hemicellulose from pine wood was studied by applying autohydrolysis treatment. A central composite experimental design was carried out using different temperatures (150-190 °C) and times (30-90 min) to select the most favorable operating conditions for maximizing the extraction of hemicellulose and minimizing its degradation. This liquid phase was analyzed by HPLC to quantify oligosaccharides, monosaccharides and degradation products. The composition of the autohydrolyzed wood was determined and characterized, employing FTIR and TGA. Herein, 60% of the hemicelluloses were extracted under a temperature of 170 °C in 60 min, presenting primarily in an oligomeric form in the liquid phase, with the solid phase remaining enriched in cellulose and lignin.

Keywords: Hemicellulose; softwood; central composite design; autohydrolysis

1. Introduction

According to the definition of International Energy Agency, biorefining is the sustainable processing of biomass into a spectrum of bio-based products (food, feed, chemicals, and materials) and bioenergy (biofuels, power and/or heat)