

Title: Py-GC/MS(FID) assessed behavior of polysaccharides during kraft delignification of Eucalyptus globulus heartwood and sapwood

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Abstract: Eucalyptus globulus heartwood, sapwood and their delignified samples by kraft pulping at 130, 150 and 170 degrees C along time were characterized in respect to total carbohydrates by Py-GC/MS(FID). No significant differences between heartwood and sapwood were found in relation to pyrolysis products and composition. The main wood carbohydrate derived pyrolysis compounds were levoglucosan (25.1%), hydroxyacetaldehyde (12.5%), 2-oxo-propanal (10.3%) and acetic acid (8.7%). Levoglucosan decreased during the early stages of delignification and increased during the bulk and residual phases. Acetic acid decreased hydroxyacetaldehyde and 2-oxo-propanal increased, and 2-furaldehyde and hydroxypropanone remained almost constant during delignification. The C/L ratio was 3.2 in wood and remained rather constant in the first pulping periods until a loss of 15-25% in carbohydrate and 60% in lignin. Afterwards it increased sharply until 44 that correspond to the removal of 25-35% of carbohydrates and 95% of lignin. The pulping reactive selectivity to lignin vs. polysaccharides was the same for sapwood and heartwood. (C) 2013 Elsevier B.V. All rights reserved.

Author Keywords: Eucalyptus globulus; Pyrolysis; Polysaccharides; Levoglucosan; C/L ratio

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