Flowthrough Pretreatment of Softwood under Water-only and Alkali Conditions

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Supplementary Materials

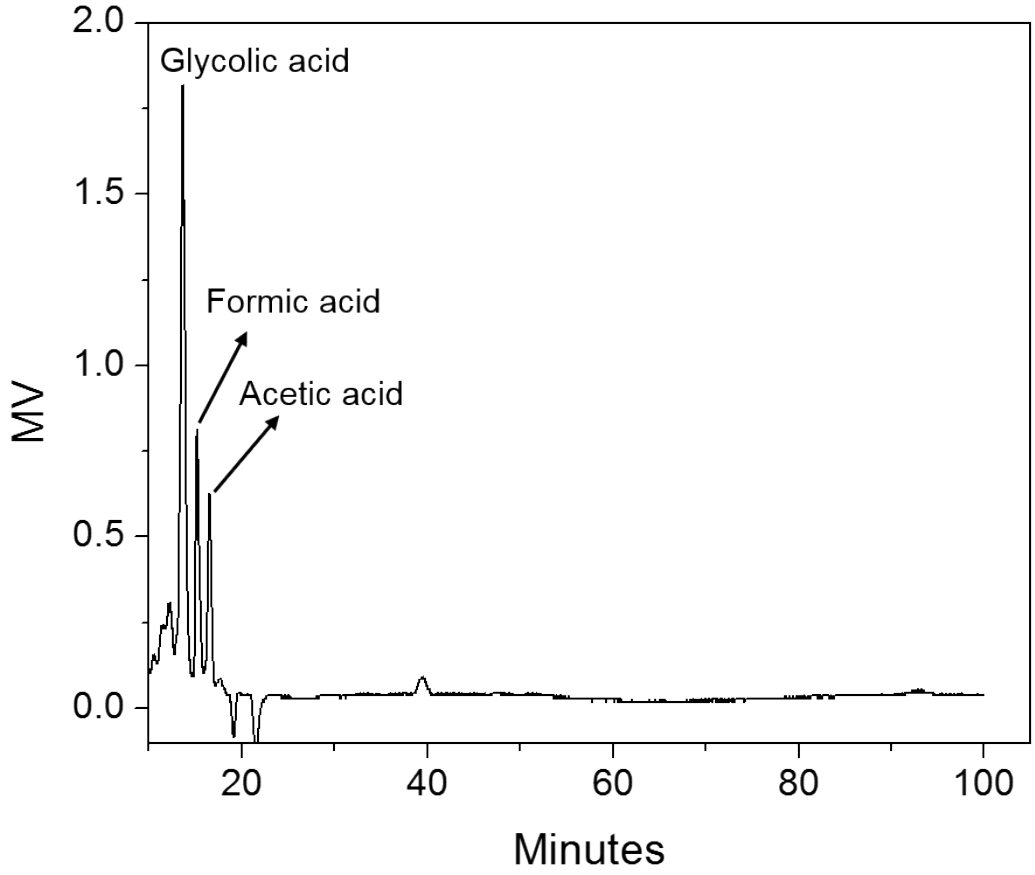

Figure S1. HPLC analysis of degradation products in pretreatment hydrolysates at pH of 12.0 and pretreatment severity of 6.1.

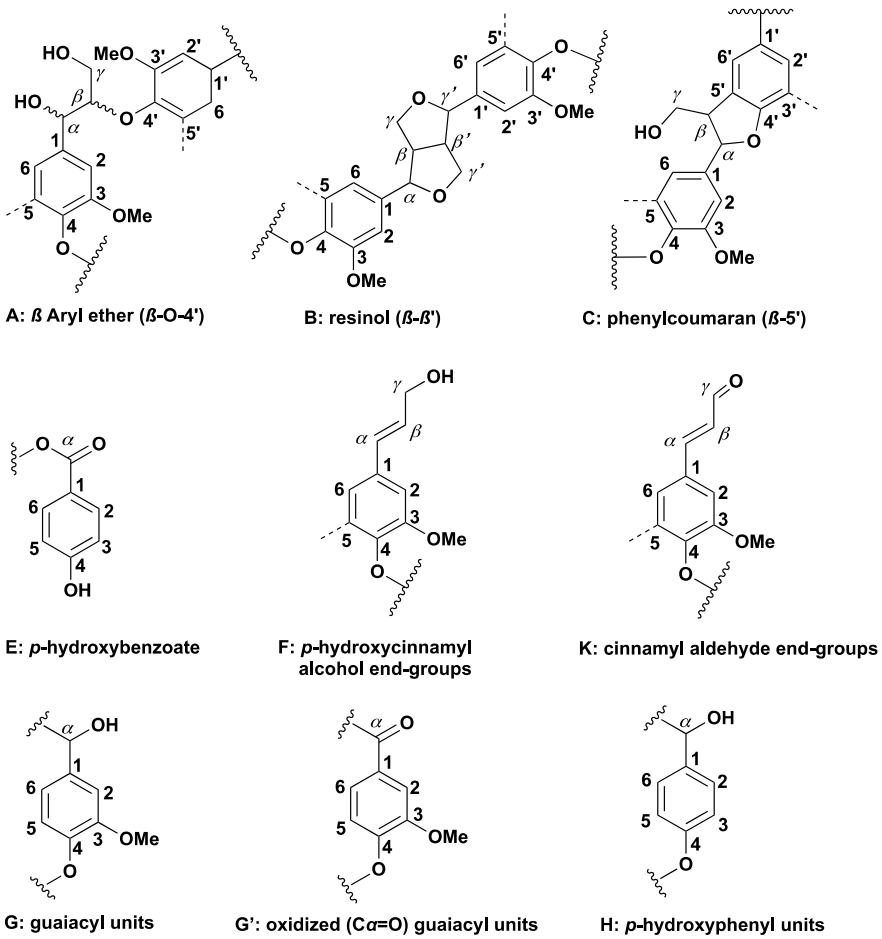

Figure S2. Main detected lignin linkages.

Table S1. Main lignin 2D ^{1}H-^{13}C cross-peak assignments in the HSQC spectra.

Label	δ_H (ppm)	δ_C (ppm)	Assignment
$-OCH_3$	3.73	56.0	C-H in methoxyls
A_α	4.71	71.3	C_α-H_α in β-O-4' substructures (A)
A_γ	3.39-3.42	60.3-60.5	C_γ-H_γ in β-O-4' substructures (A)
$A_{\beta(G/H)}$	4.29	84.0	C_β-H_β in β-O-4' substructures linked to G and H units (A)
$A_{\beta(S)}$	4.22	84.8	C_β-H_β in β-O-4' substructures linked to S units (A)
B_α	4.65	85.4	C_α-H_α in resinol (β-β') substructures (B)
B_β	3.05	54.0	C_β-H_β in resinol (β-β') substructures (B)
B_γ	3.80 and 4.16	71.6	C_γ-H_γ in resinol (β-β') substructures (B)
C_α	5.43	87.4	C_α-H_α in phenylcoumaran substructures (C)
C_β	3.43	53.6	C_β-H_β in phenylcoumaran substructures (C)
C_γ	3.68	63.1	C_γ-H_γ in phenylcoumaran substructures (C)
$E_{2/6}$	7.67	131.8	$C_{2,6}$-$H_{2,6}$ in *p*-hydroxybenzoate substructures (E)
F_γ	4.09	61.9	C_γ-H_γ in *p*-hydroxycinnamyl alcohol end-groups (F)
G_2	6.97	111.5	C_2-H_2 in guaiacyl units (G)
G_5	6.74	115.5	C_5-H_5 in guaiacyl units (G)
G_6	6.76	119.1	C_6-H_6 in guaiacyl units (G)
G'_2	7.38	111.0	C_2-H_2 in oxidized (C_α=O) guaiacyl units (G')
G'_6	7.5	123.4	C_6-H_6 in oxidized (C_α=O) guaiacyl units (G')
$H_{2/6}$	7.18	128.3	$C_{2,6}$-$H_{2,6}$ in *p*-hydroxyphenyl units (H)
K_β	6.77	126.7	C_β-H_β in cinnamyl aldehyde end-groups (K)
X_2	3.02	73.0	C_2-H_2 in β-D-xylopyranoside
X_3	3.23	74.4	C_3-H_3 in β-D-xylopyranoside
X_4	3.49	75.8	C_4-H_4 in β-D-xylopyranoside
X_5	3.16	63.5	C_5-H_5 in β-D-xylopyranoside
$X2_2$	4.49	73.7	C_2-H_2 in 2-O-acetyl-β-D-xylopyranoside
$X3_3$	4.78	75.3	C_3-H_3 in 3-O-acetyl-β-D-xylopyranoside