Supplementary information

Quantitative $^{13}$C NMR spectra of pyrolytic lignin, LMW fraction, HMW fraction, and hydrogenated pyrolytic lignin after three steps of hydrogenation.

![Quantitative $^{13}$C NMR spectra](image)

Figure S1. Quantitative $^{13}$C NMR of pyrolytic lignin (A), LMW fraction (B), HMW fraction (C), and hydrogenated pyrolytic lignin (D) after three steps of hydrogenation. Highlights the carboxyl/carbonyl, aromatic, C-O aliphatic, and C-C aliphatic regions as well as the internal standard (benzaldehyde), residual ethanol, and the solvent (d6-DMSO).
Rotary evaporation results of pyrolytic lignin, LMW fraction, and HMW fraction in ethanol (10 wt.%)

Table S1. Rotary evaporation results of pyrolytic lignin, the LMW fraction, and the HMW fraction in ethanol (10 wt.%)
(Rotary evaporation conditions: 170 mbar of pressure, 55 °C, 5 g of substrates, 1 h.)

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Mass yield (wt. %)</th>
<th>Carbon yield (Carbon %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volatile liquids</td>
<td>Non-volatile liquids</td>
</tr>
<tr>
<td>Pyrolytic lignin</td>
<td>24.2</td>
<td>75.9</td>
</tr>
<tr>
<td>LMW</td>
<td>N/A</td>
<td>107.8</td>
</tr>
<tr>
<td>HMW</td>
<td>29.9</td>
<td>70.1</td>
</tr>
</tbody>
</table>

* Volatile liquids: distillates after rotor evaporation of liquid product at 55 °C and 170 mbar for 1 h.

b Non-volatile liquids: distillate residue after rotor evaporation of liquid product at 55 °C and 170 mbar for 1 h.

Temperature and reaction pressure as a function of reaction time

Figure S2. Temperature (□) and pressure (ο) as a function of reaction time during the hydrogenation of pyrolytic lignin. Reaction condition: reaction temperature: 150 °C, heating rate: 10 °C/min, 2.5 h, initial hydrogen pressure: 725 psig, 10 g pyrolytic lignin in ethanol (10 wt.%), 1.5 g Ru/TiO₂.