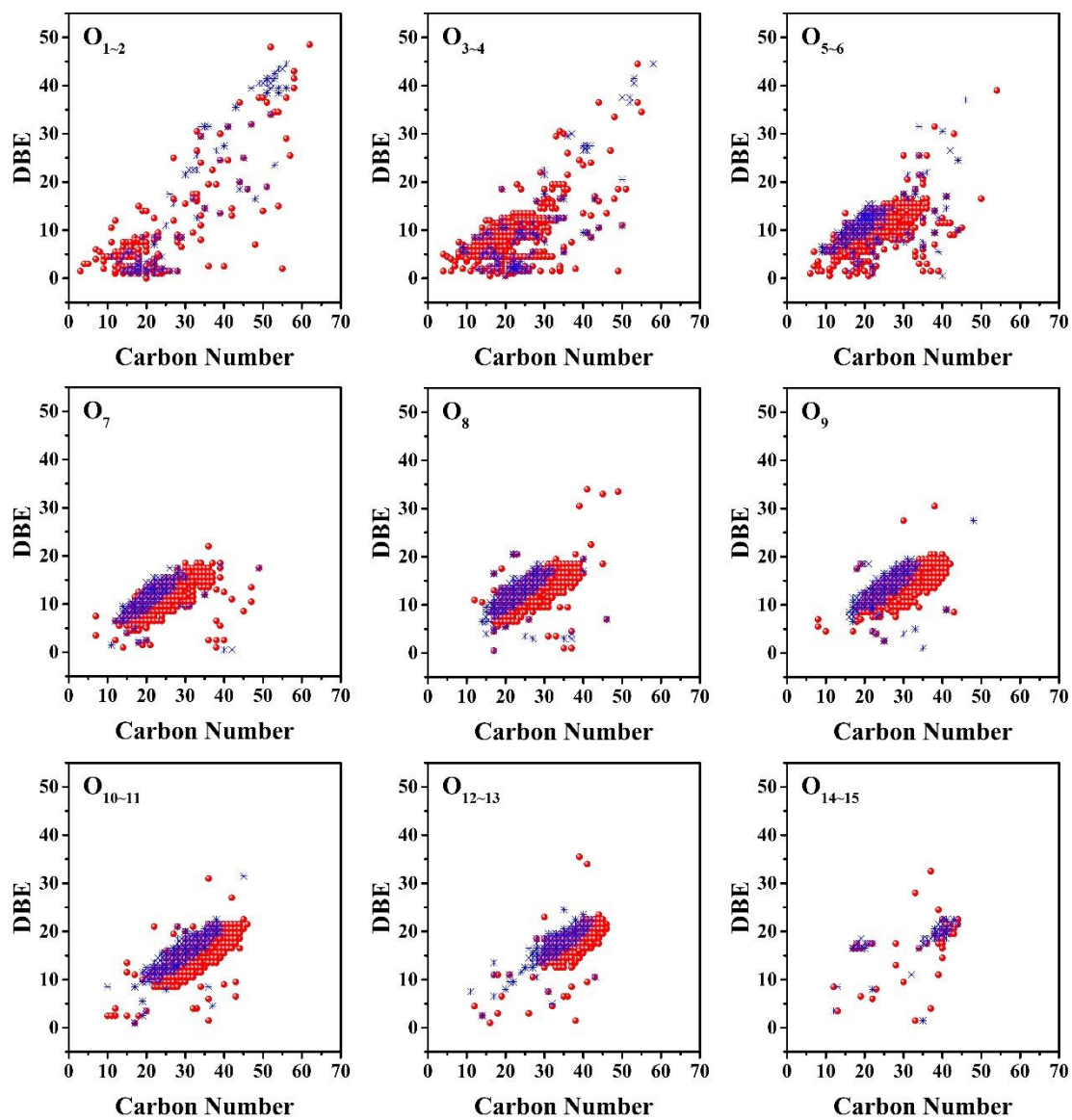


Supporting Information for:

**Highly efficient catalytic transfer hydrogenolysis for the conversion  
of Kraft lignin into bio-oil over heteropoly acids**

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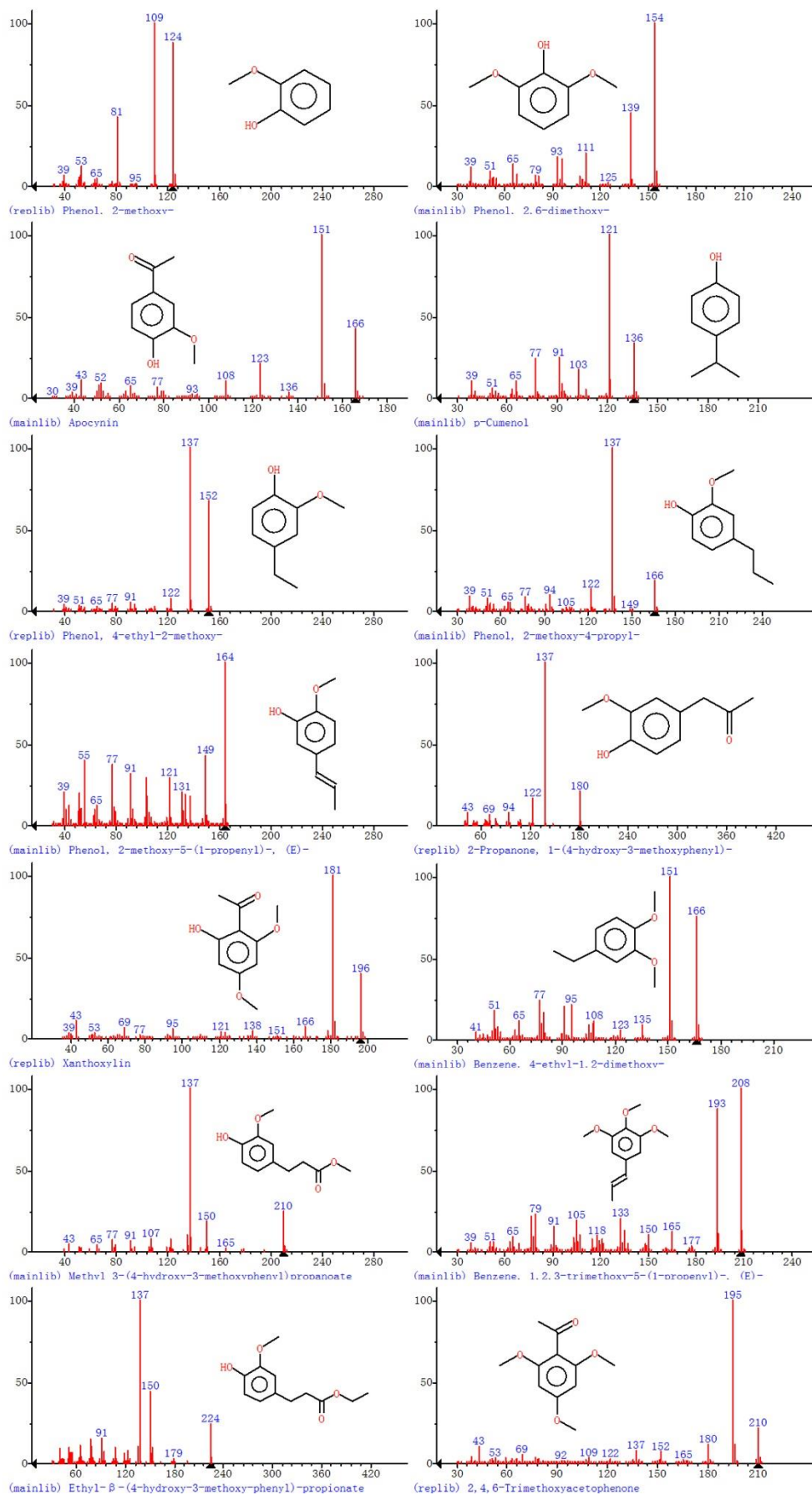


**Fig. S1** Double bond equivalent (DBE) vs. carbon number plots for oxygen class compounds in EKL (※) and lignin oil (●), observed with negative-ion ESI.



**Table S1** Assignments of the main  $^{13}\text{C}$ - $^1\text{H}$  correlation signals in the HSQC spectra<sup>[1]</sup>

Labels	Chemical shift $\delta_{\text{C}}/\delta_{\text{H}}$ (ppm)	Assignments
$\text{A}_{\alpha}$	85.8/4.65	$\text{C}_{\alpha}\text{-H}_{\alpha}$ in resinol substructures
$\text{A}_{\beta}$	54.1/3.07	$\text{C}_{\beta}\text{-H}_{\beta}$ in resinol substructures
$\text{OCH}_3$	56.2/3.73	C–H in methoxyls
$\text{B}_{\alpha}$	71.5/4.75	$\text{C}_{\alpha}\text{-H}_{\alpha}$ in $\beta\text{-O-4'}$ linked to G units
$\text{B}_{\alpha}$	72.2/4.98	$\text{C}_{\alpha}\text{-H}_{\alpha}$ in $\beta\text{-O-4'}$ linked to S units
$\text{B}'_{\beta}$	81.9.2/4.77	$\text{C}_{\beta}\text{-H}_{\beta}$ in $\beta\text{-O-4'}$ substructures with a conjugated carbonyl or carboxyl group
$\text{X}_1$	102.2/4.29	$\text{C}_1\text{-H}_1$ in xylan
$\text{X}_2$	73.1/3.14	$\text{C}_2\text{-H}_2$ in xylan
$\text{X}_3$	74.6/3.34	$\text{C}_3\text{-H}_3$ in xylan
$\text{X}_4$	75.9/3.58	$\text{C}_4\text{-H}_4$ in xylan
$\text{S}_{2,6}$	104.0/6.62, 6.86 105.3/7.00, 7.10 106.6/7.26	$\text{C}_{2,6}\text{-H}_{2,6}$ in syringyl units
$\text{S}'_{2,6}$	107.7/7.22 108.5/7.22 109.7/7.15	$\text{C}_{2,6}\text{-H}_{2,6}$ in oxidized ( $\text{C}\alpha=\text{O}$ ) syringyl units
$\text{G}_2$	112.9/6.80	$\text{C}_2\text{-H}_2$ in guaiacyl units
$\text{G}_5$	115.6/6.74	$\text{C}_5\text{-H}_5$ in guaiacyl units
$\text{G}_6$	120.2/6.76 121.0/7.23	$\text{C}_6\text{-H}_6$ in guaiacyl units



**Fig. S3** Mass spectra for the main monomer products from lignin oil

## References

- [1] a) C. Fernández-Costas, S. Gouveia, M. A. Sanromán, D. Moldes, *Biomass and Bioenergy* **2014**, *63*, 156-166; b) H. Zhang, Y. Bai, B. Yu, X. Liu, F. Chen, *Green Chemistry* **2017**, *19*, 5152-5162.