Electronic Supplementary Information

Sustainable Electrochemical Depolymerization of Lignin in Reusable Ionic Liquids

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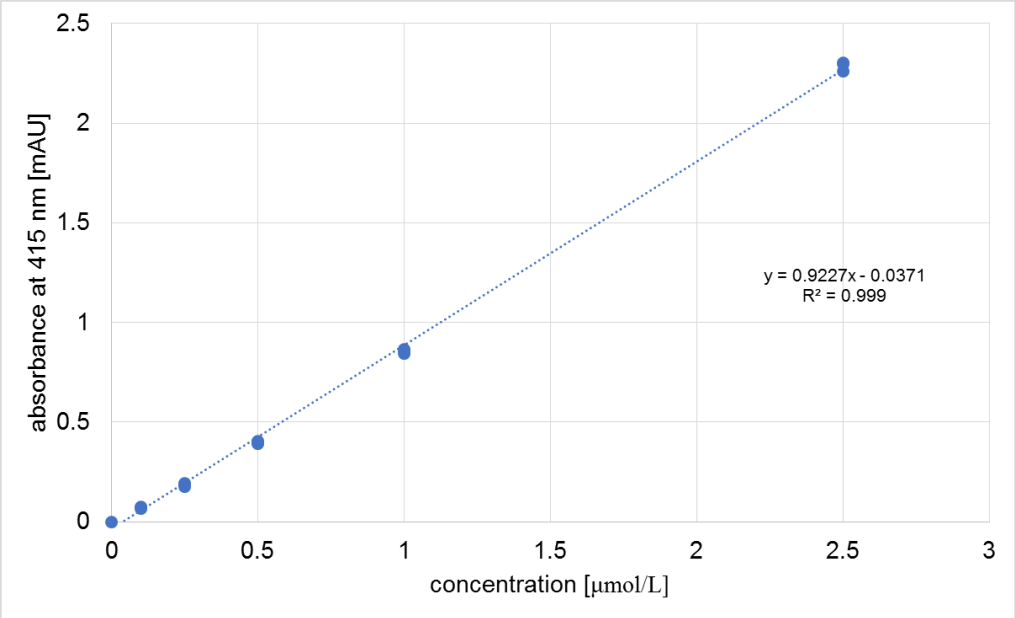

Figure 1. Calibration curve of the titanium(IV)-hydrogen peroxide complex using UV/Vis spectrometry at 415 nm. Concentrations of the calibration solutions: 0.0, 0.1, 0.25, 0.5, 1.0, and 2.5 µmol/L.

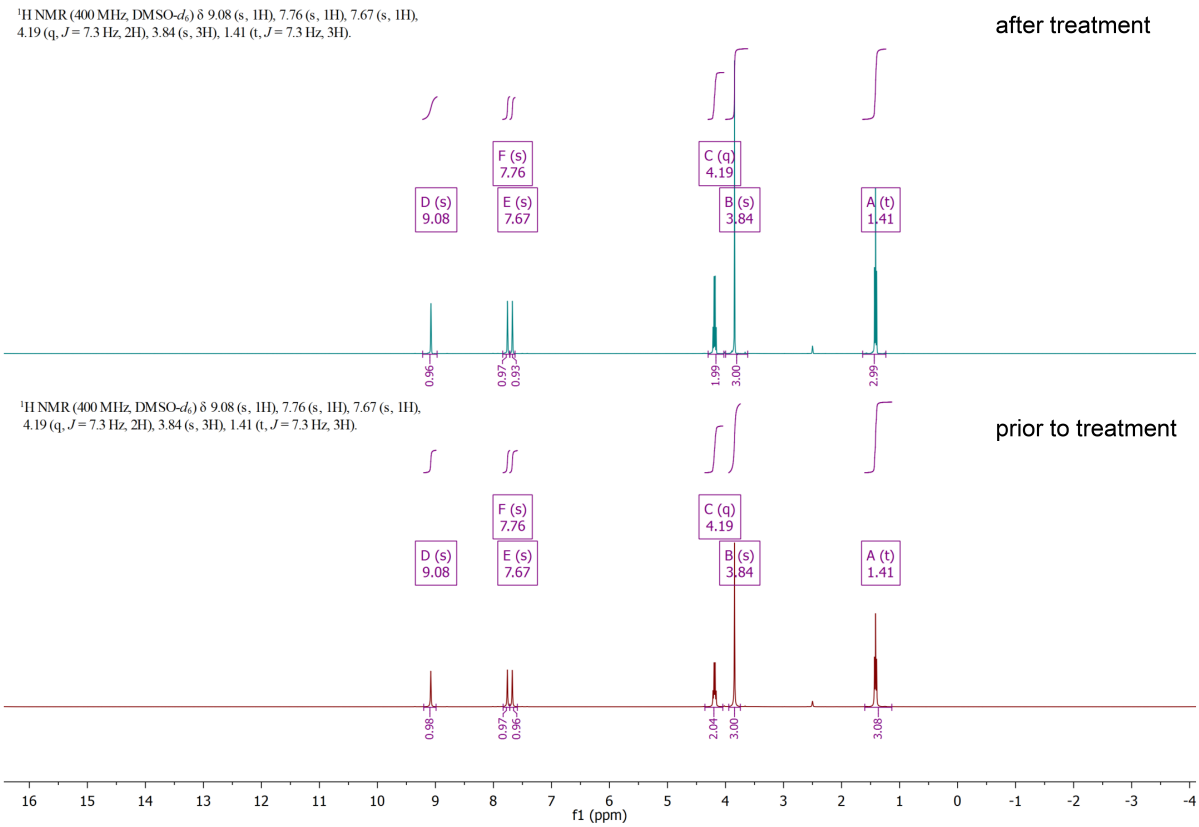

Figure S2. NMR spectra of 1-ethyl-3-methylimidazolium trifluoromethanesulfonate ([emim][OTf]) after (top) and prior to electrochemical treatment (bottom).

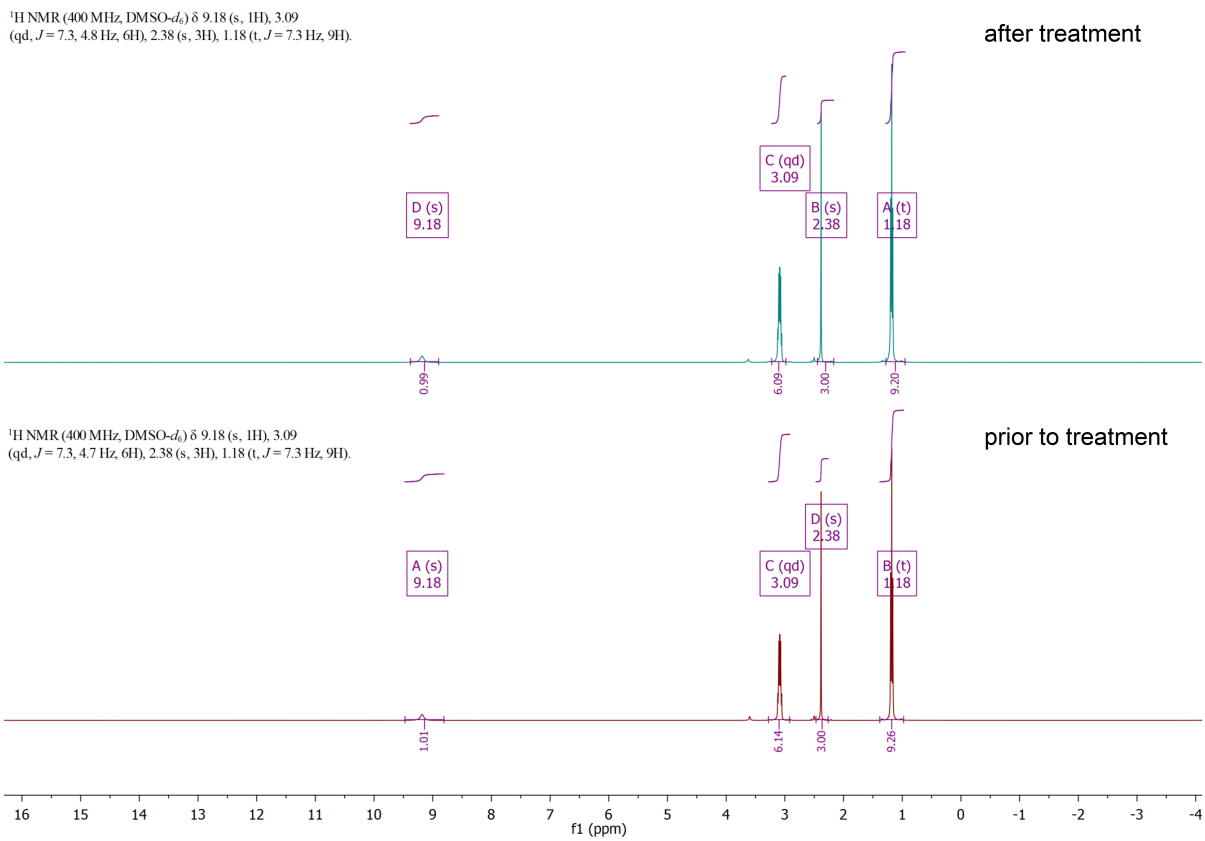

Figure S3. NMR spectra of triethylammonium methanesulfonate (TMS) after (top) and prior to electrochemical treatment (bottom).

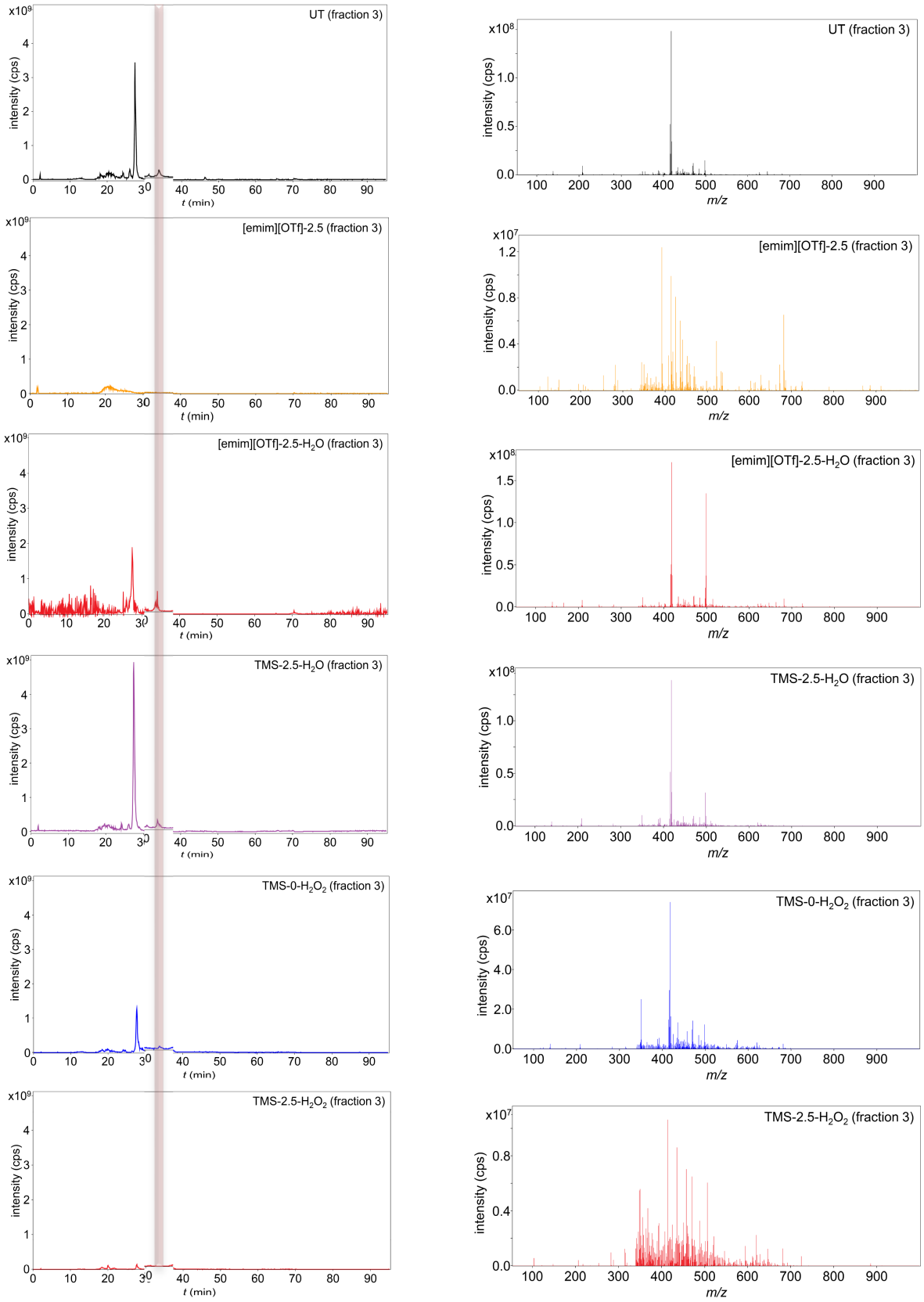

Figure S4. Base peak chromatograms (left) and averaged mass spectra (retention time, 34 min) (right) for each performed degradation process. Alkali lignin was used for all experiments.

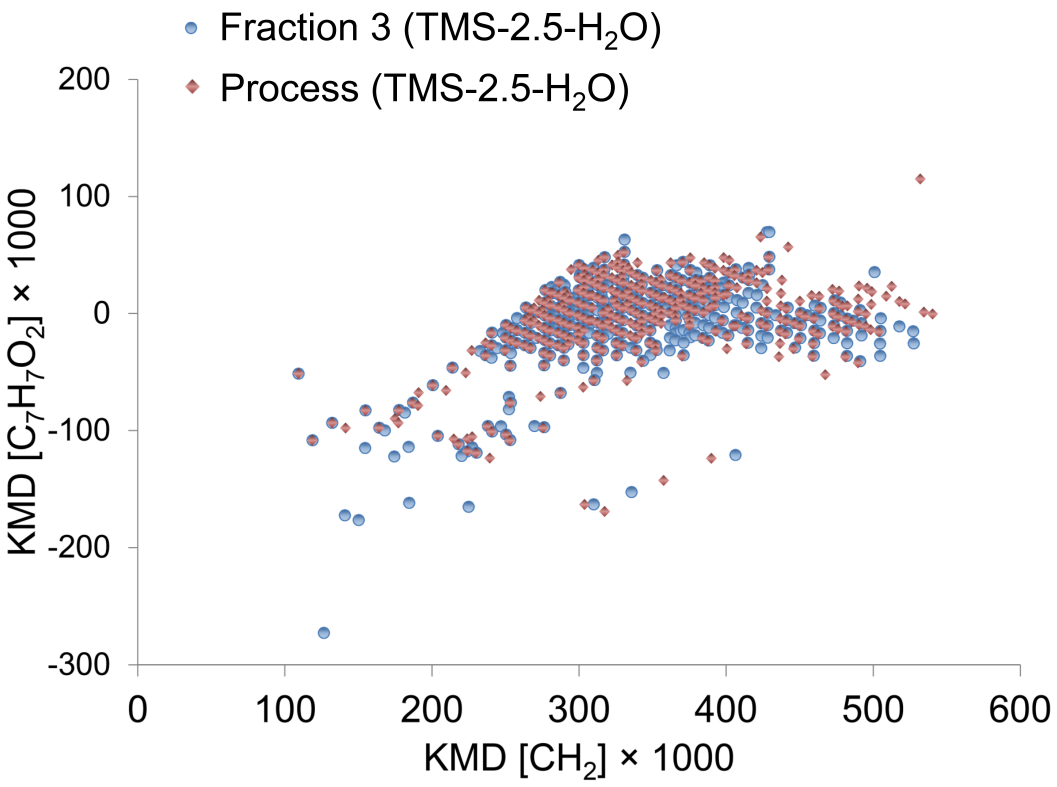

Figure S5. Overlay of Kendrick mass defect data of the purified fraction 3 from TMS-2.5-H_2O and the corresponding raw mixture after electrochemical treatment using 2D mass defect filtering.

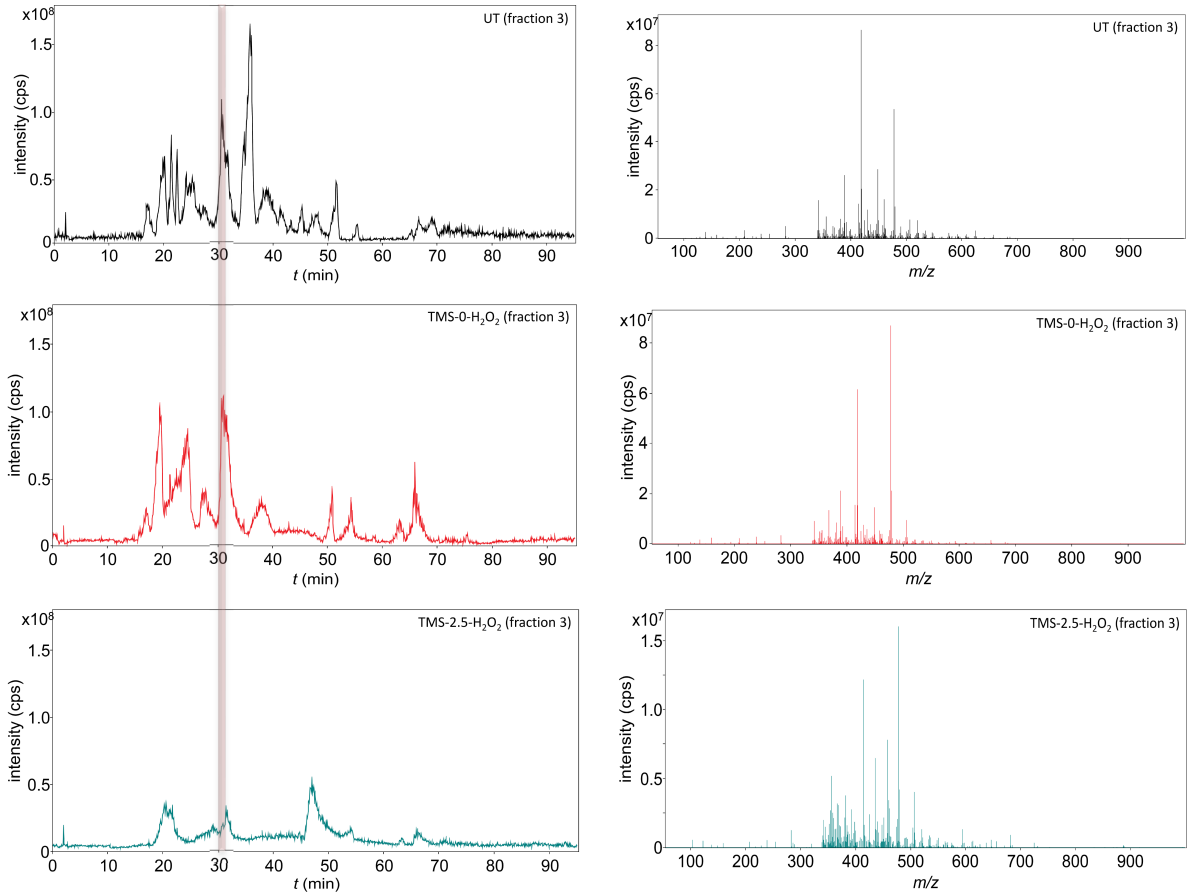

Figure S6. Base peak chromatograms (left) and averaged mass spectra (retention time, 30.5 min) (right) for each degradation process. Organosolv lignin was used for all experiments.

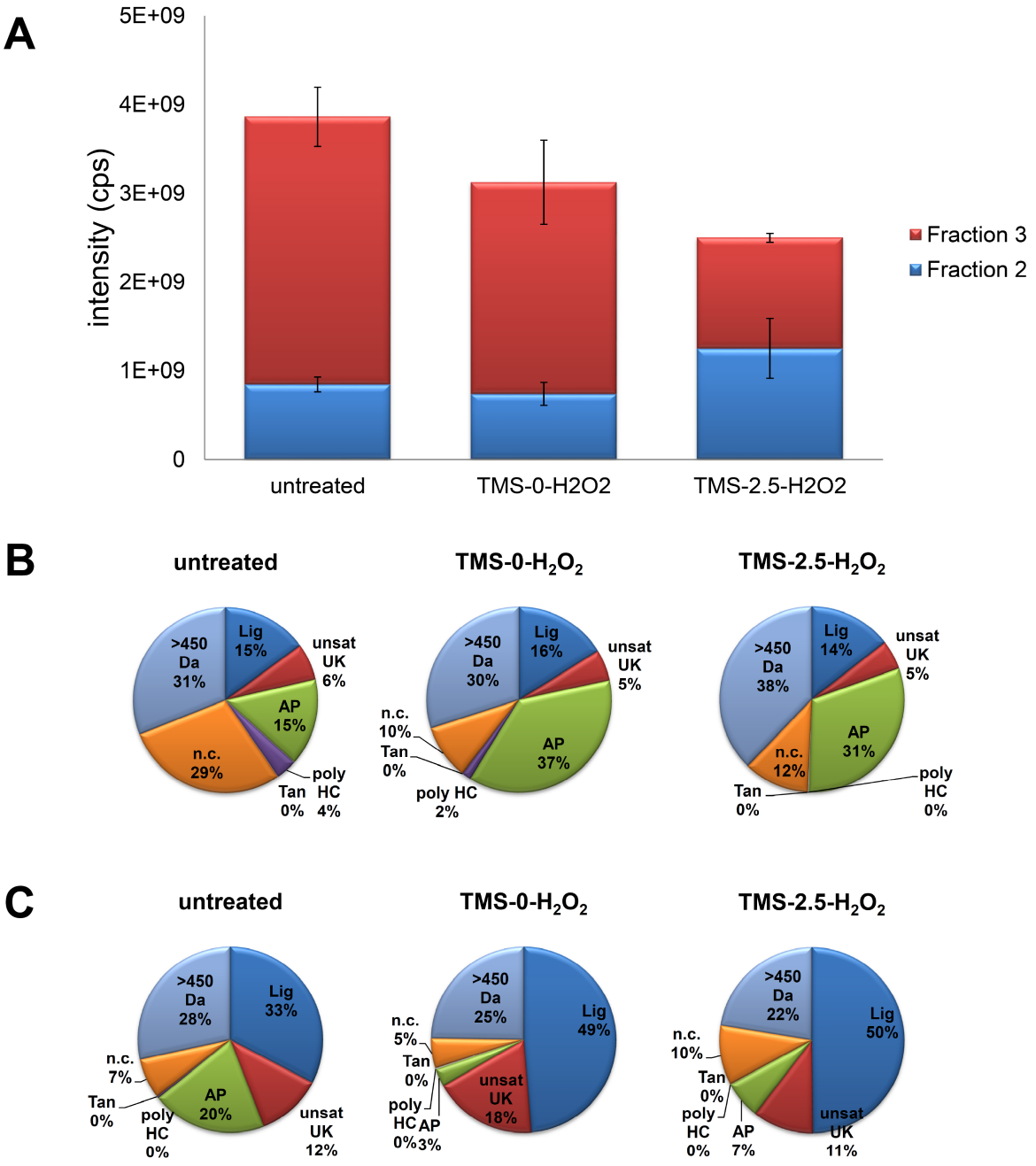

Figure S7. A Total intensity for relevant lignin degradation products (mass concentration, β=100 µg/mL). **B** Relative distributions (%) of chemical classes for fraction 2. **C** Relative distributions (%) of chemical classes for fraction 3. Distributions were restricted to $m/z \leq 450$, unless otherwise specified. Organosolv lignin was used for all experiments.