

## **A novel biorefinery concept based on marginally used halophyte biomass**

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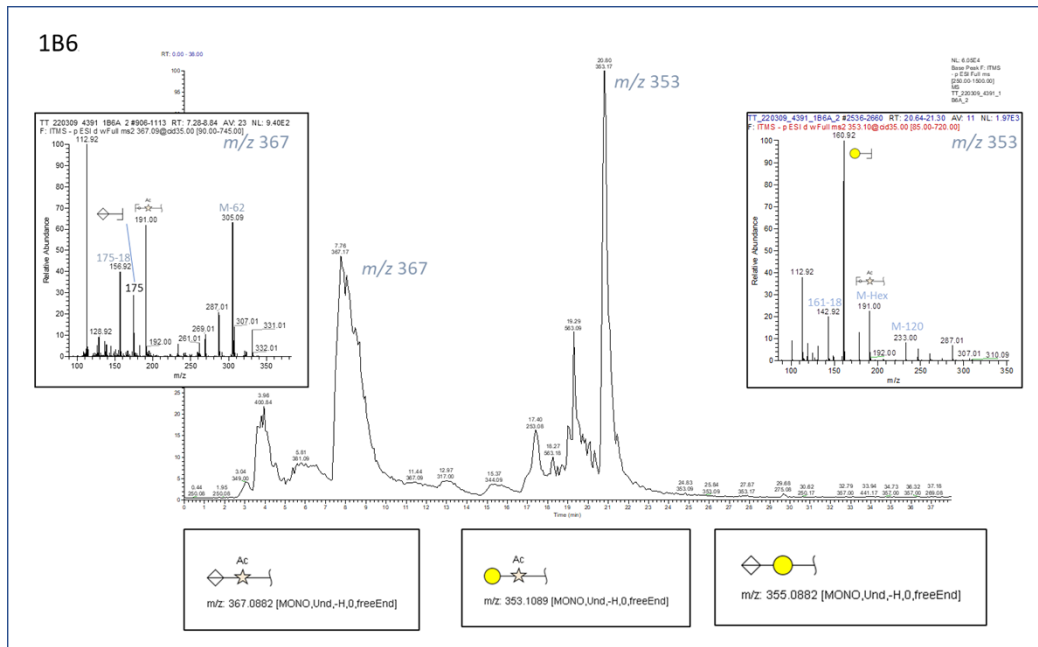
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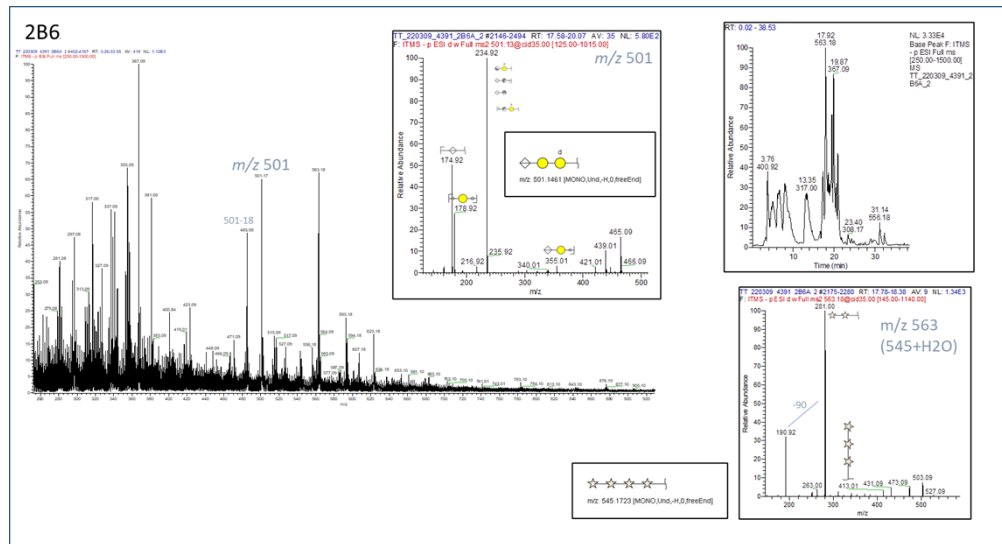
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## List of supplementary figures:

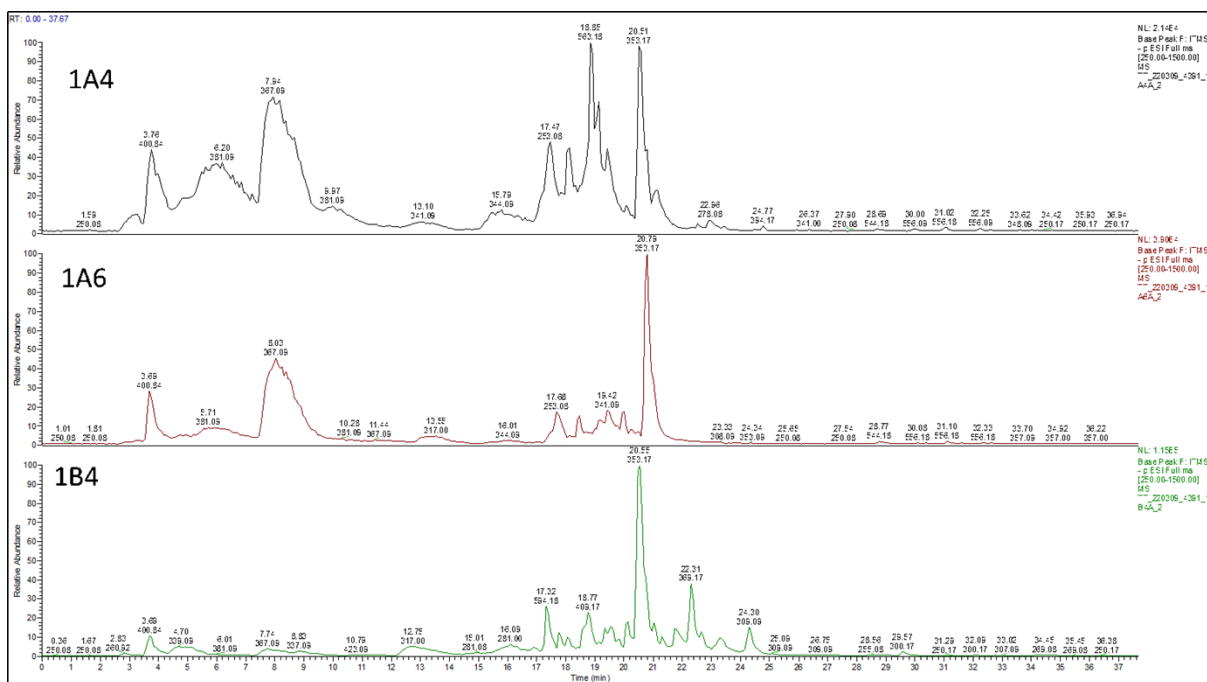
<b>Figure S1:</b> Base peak chromatogram of <i>S. ramosissima</i> pretreated at 180 °C for 30 min with 60% ethanol; the MS2 inserts show the major glycans at m/z 367 and 353. Optional interpretations are shown. ....	3
<b>Figure S2:</b> Combined mass spectra and base peak chromatogram of <i>S. ramosissima</i> pretreated at 160 °C for 30 min with 60% ethanol; the MS2 inserts show the major glycans at m/z 501 and 563. Optional interpretations are shown. ....	3
<b>Figure S3:</b> Base peak chromatograms of <i>S. ramosissima</i> pretreated at 180 °C for 15 min with 40% and 60% ethanol, as well as at 180 °C for 30 min with 40% ethanol. The samples were analyzed in negative ion mode. ....	4
<b>Figure S4:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 0A4. ....	5
<b>Figure S5:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 0A6. ....	6
<b>Figure S6:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 0B4. ....	7
<b>Figure S7:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 0B6. ....	8
<b>Figure S8:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 0C4. ....	9
<b>Figure S9:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 0C6. ....	10
<b>Figure S10:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1A4. ....	11
<b>Figure S11:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1A6. ....	12
<b>Figure S12:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1B4. ....	13
<b>Figure S13:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1B6. ....	14
<b>Figure S14:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1C4. ....	15
<b>Figure S15:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1C6. ....	16
<b>Figure S16:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1D4. ....	17
<b>Figure S17:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 1D6. ....	18
<b>Figure S18:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 2B4. ....	19
<b>Figure S19:</b> HSQC and quantitative <sup>13</sup> C NMR spectra of lignin sample 2B6. ....	20



**Figure S1:** Base peak chromatogram of *S. ramosissima* pretreated at 180 °C for 30 min with 60% ethanol; the MS2 inserts show the major glycans at  $m/z$  367 and 353. Optional interpretations are shown.

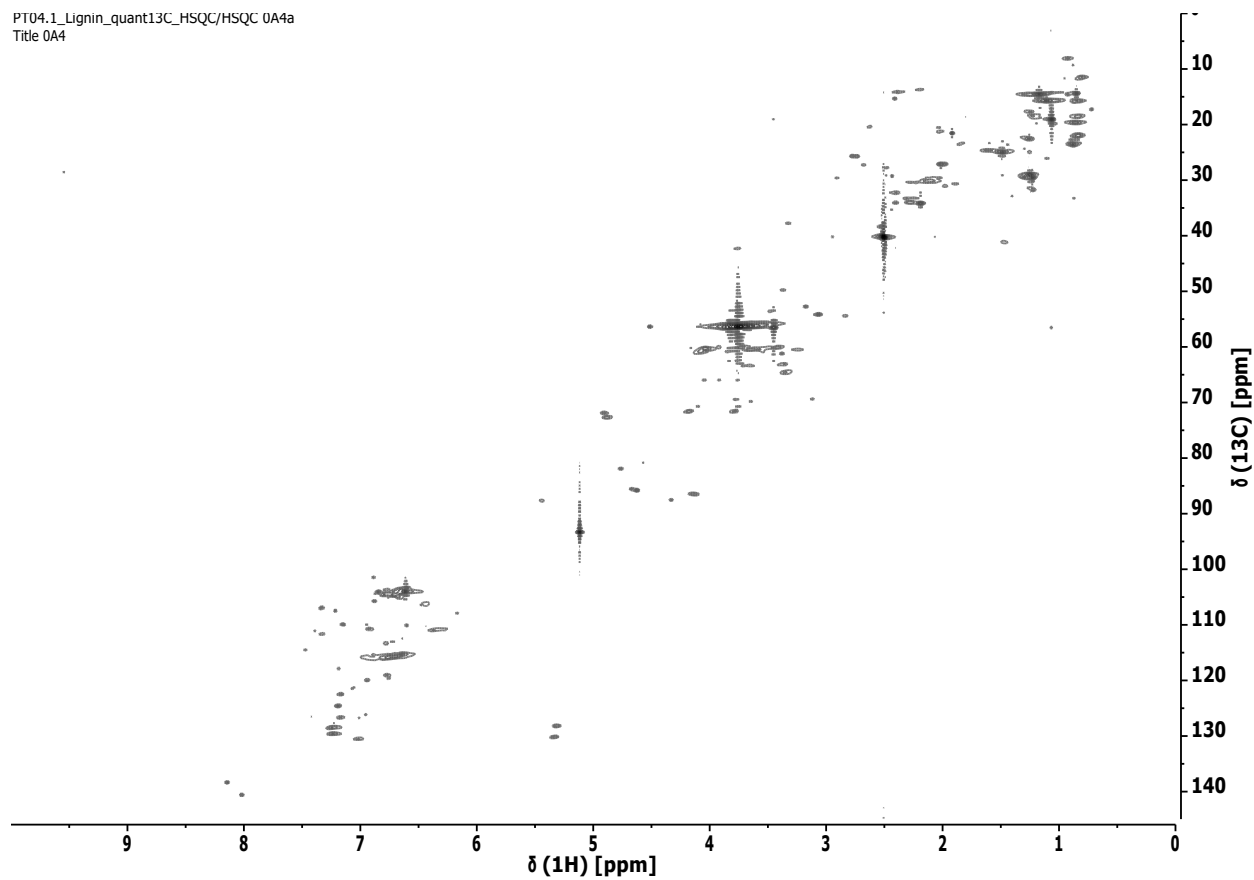


**Figure S2:** Combined mass spectra and base peak chromatogram of *S. ramosissima* pretreated at 160 °C for 30 min with 60% ethanol; the MS2 inserts show the major glycans at  $m/z$  501 and 563. Optional interpretations are shown.



**Figure S3:** Base peak chromatograms of *S. ramosissima* pretreated at 180 °C for 15 min with 40% and 60% ethanol, as well as at 180 °C for 30 min with 40% ethanol. The samples were analyzed in negative ion mode.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 0A4a  
Title 0A4



PT04.1\_Lignin\_quant13C\_HSQC/13C 0A4a  
Title 0A4

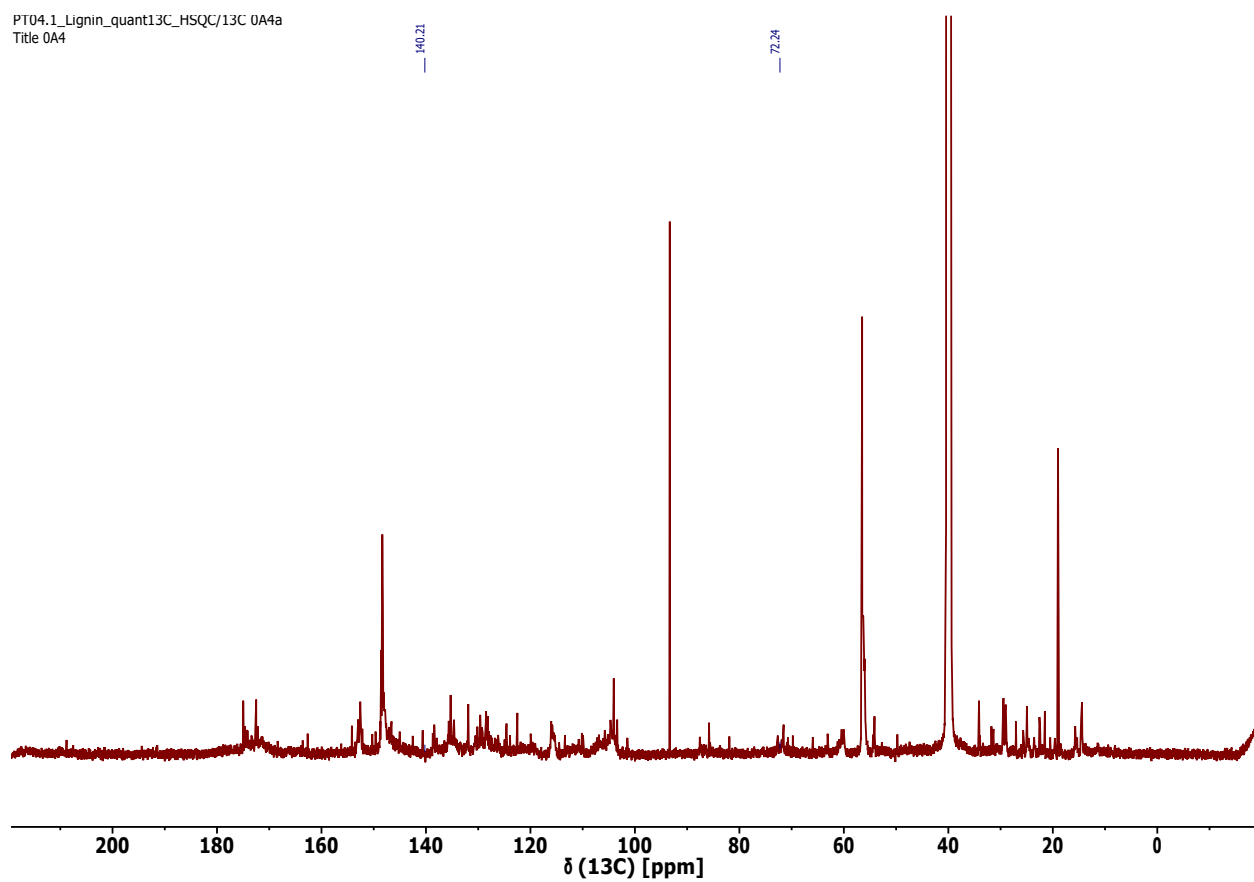
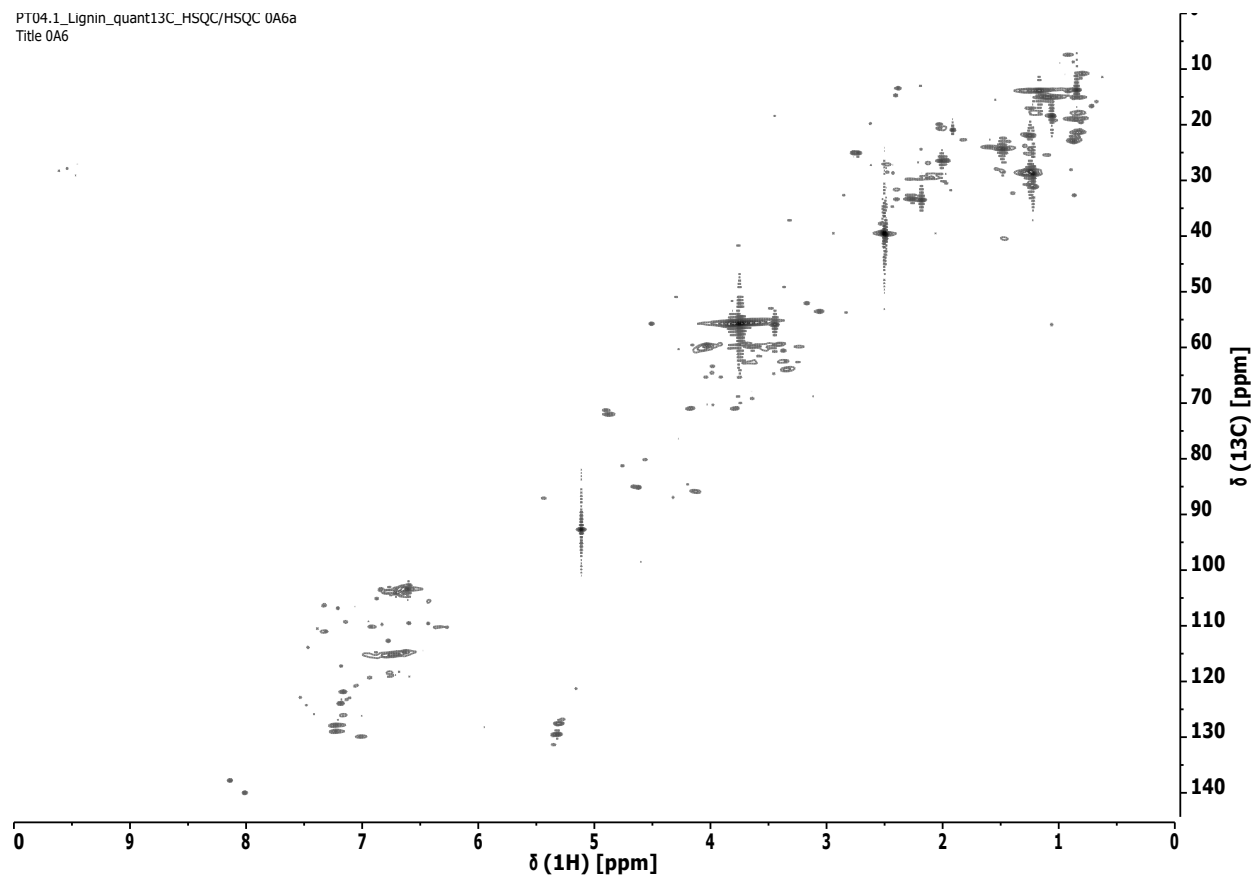


Figure S4: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 0A4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 0A6a  
Title 0A6



PT04.1\_Lignin\_quant13C\_HSQC/13C 0A6a  
Title 0A6

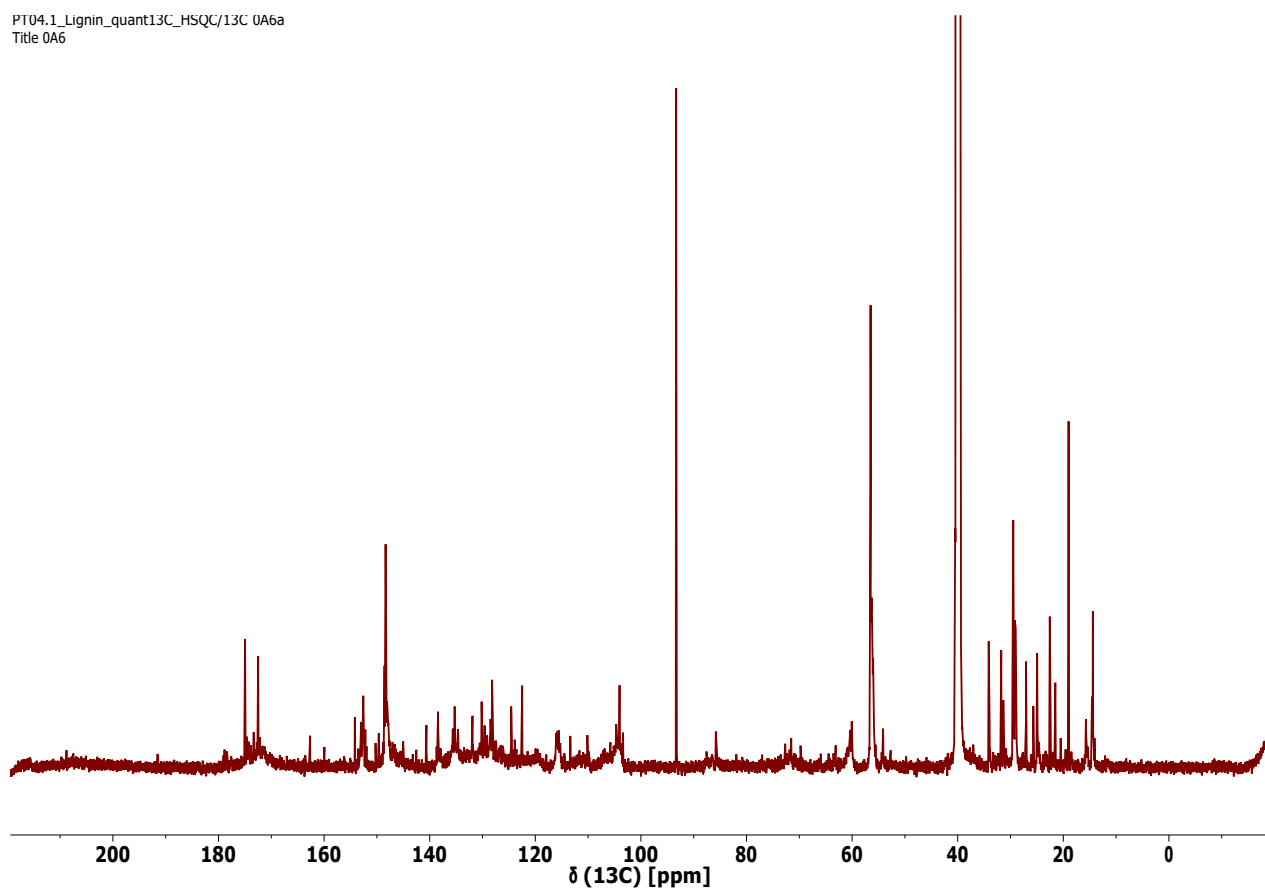
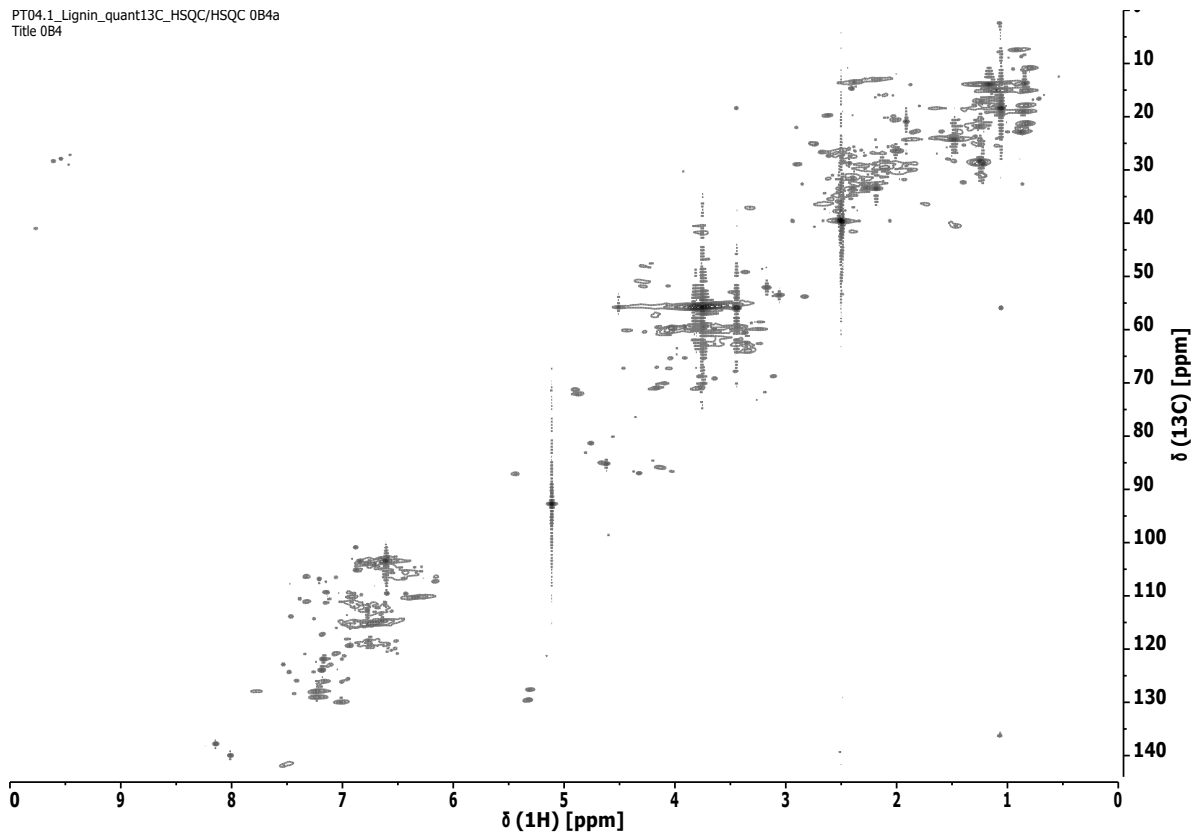


Figure S5: HSQC and quantitative  $^{13}\text{C}$  NMR spectra of lignin sample 0A6.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 0B4a  
Title 0B4



PT04.1\_Lignin\_quant13C\_HSQC/13C 0B4a  
Title 0B4

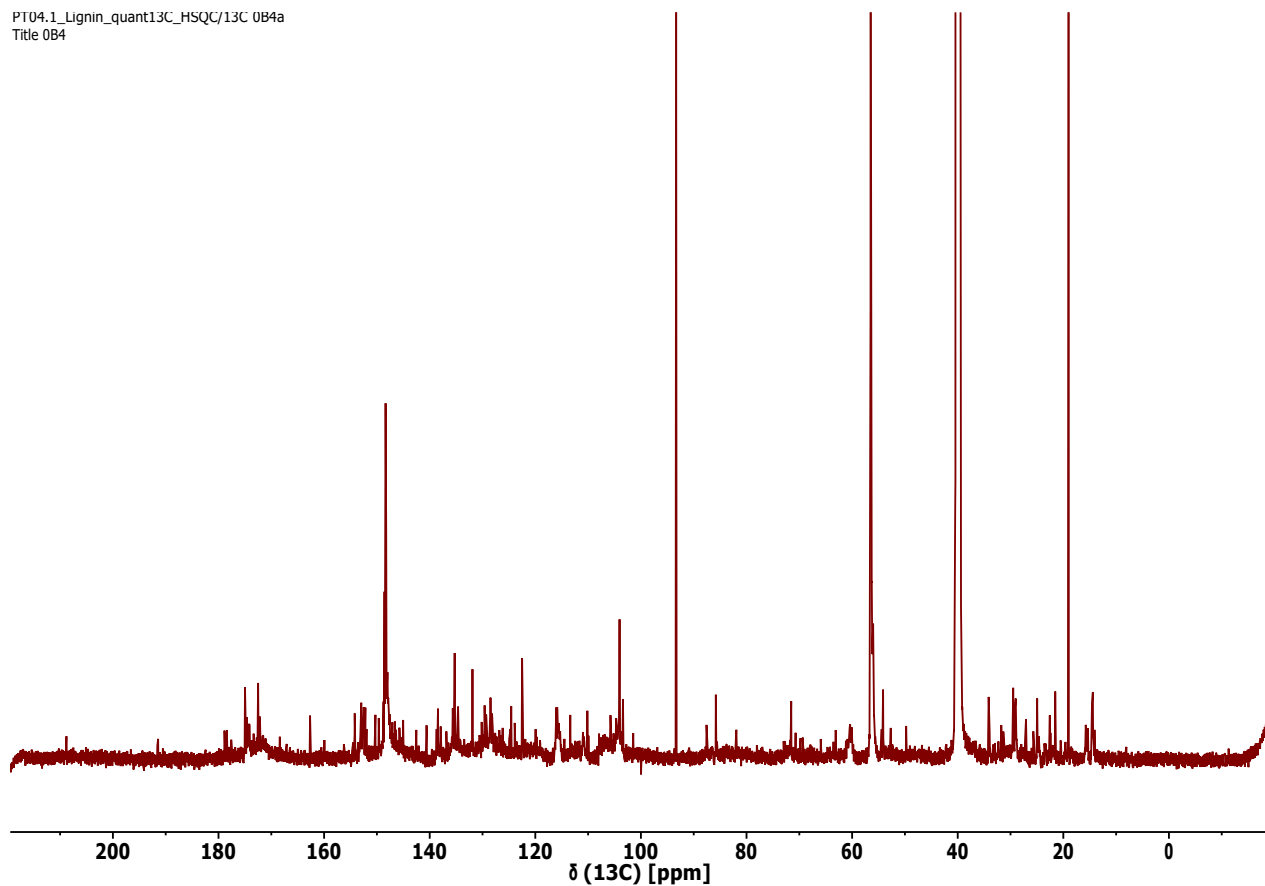
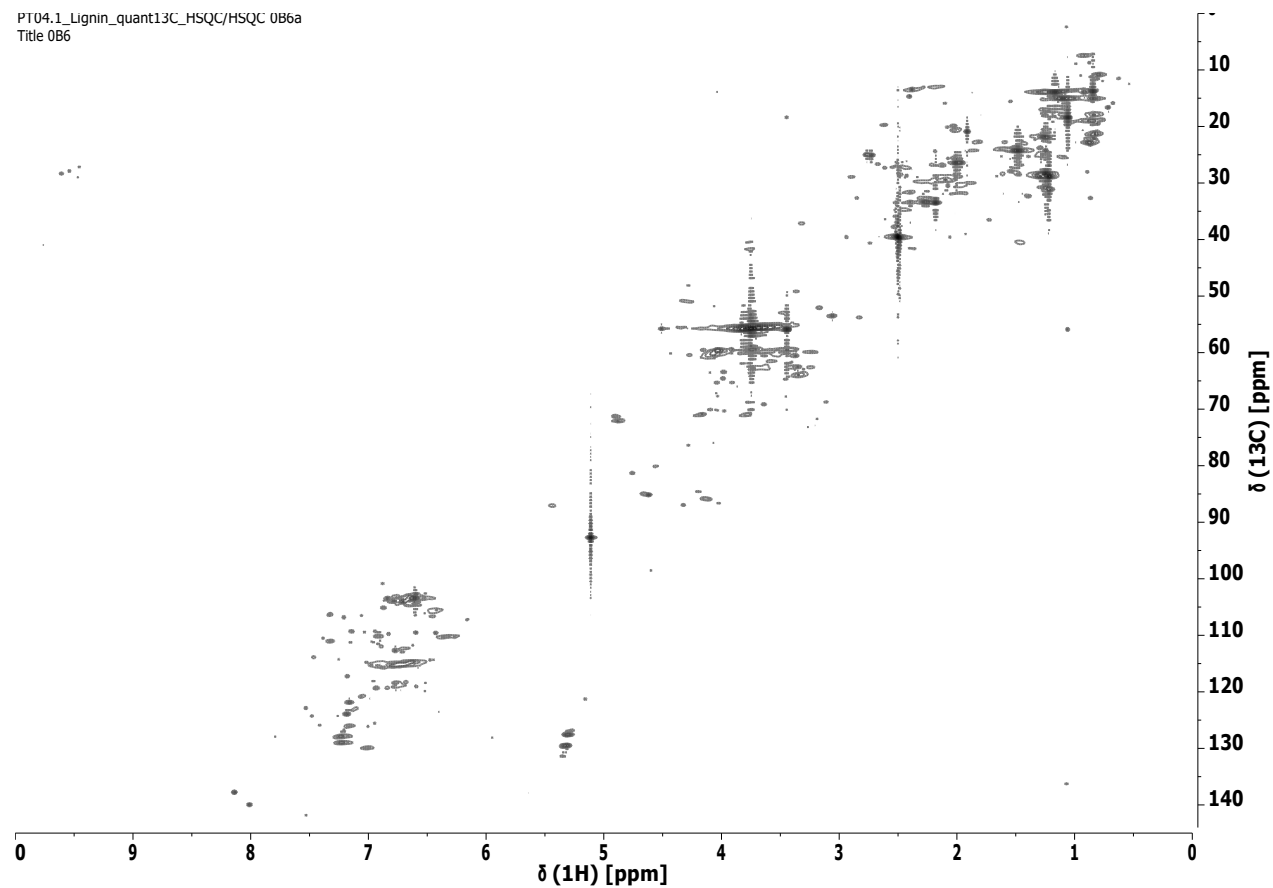


Figure S6: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 0B4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 0B6a  
Title 0B6



PT04.1\_Lignin\_quant13C\_HSQC/13C 0B6a  
Title 0B6

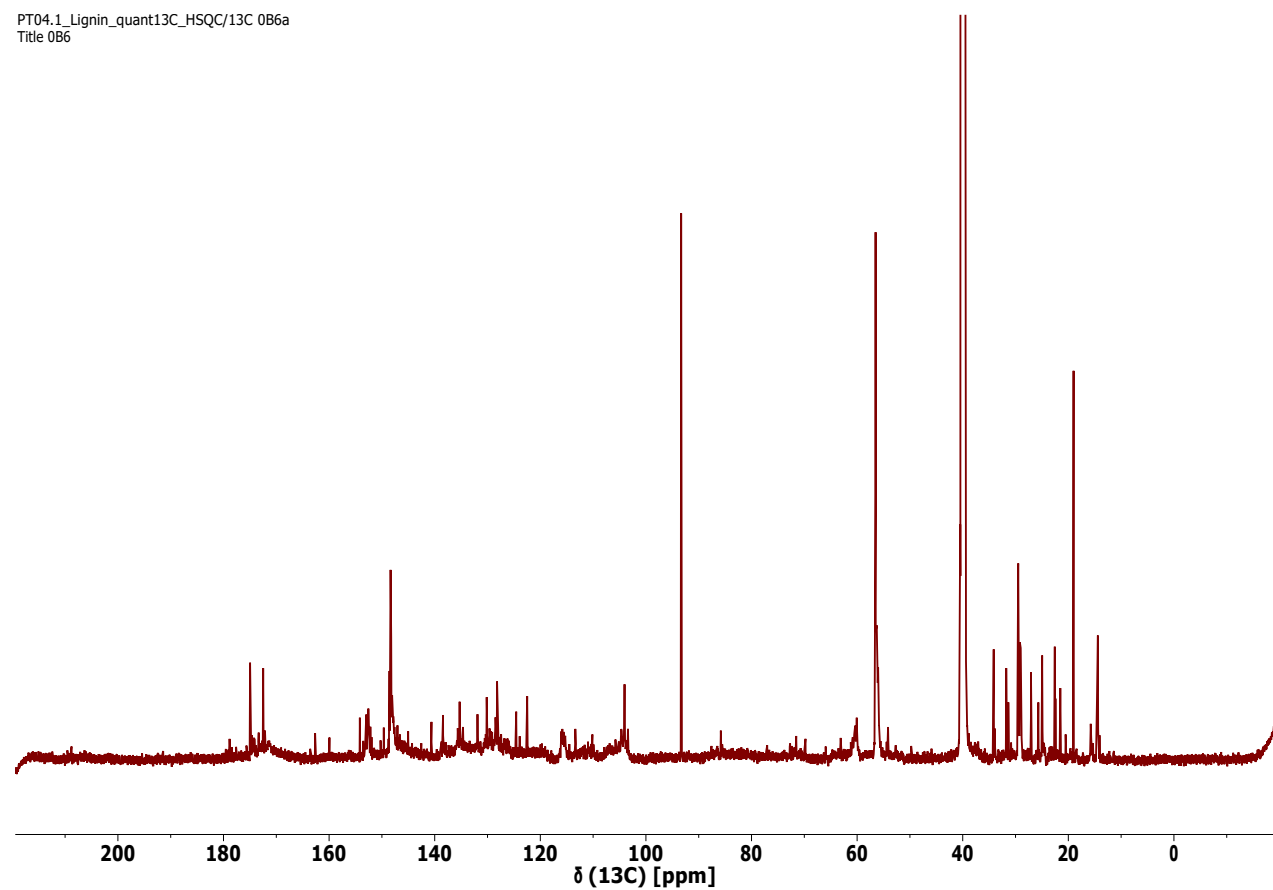
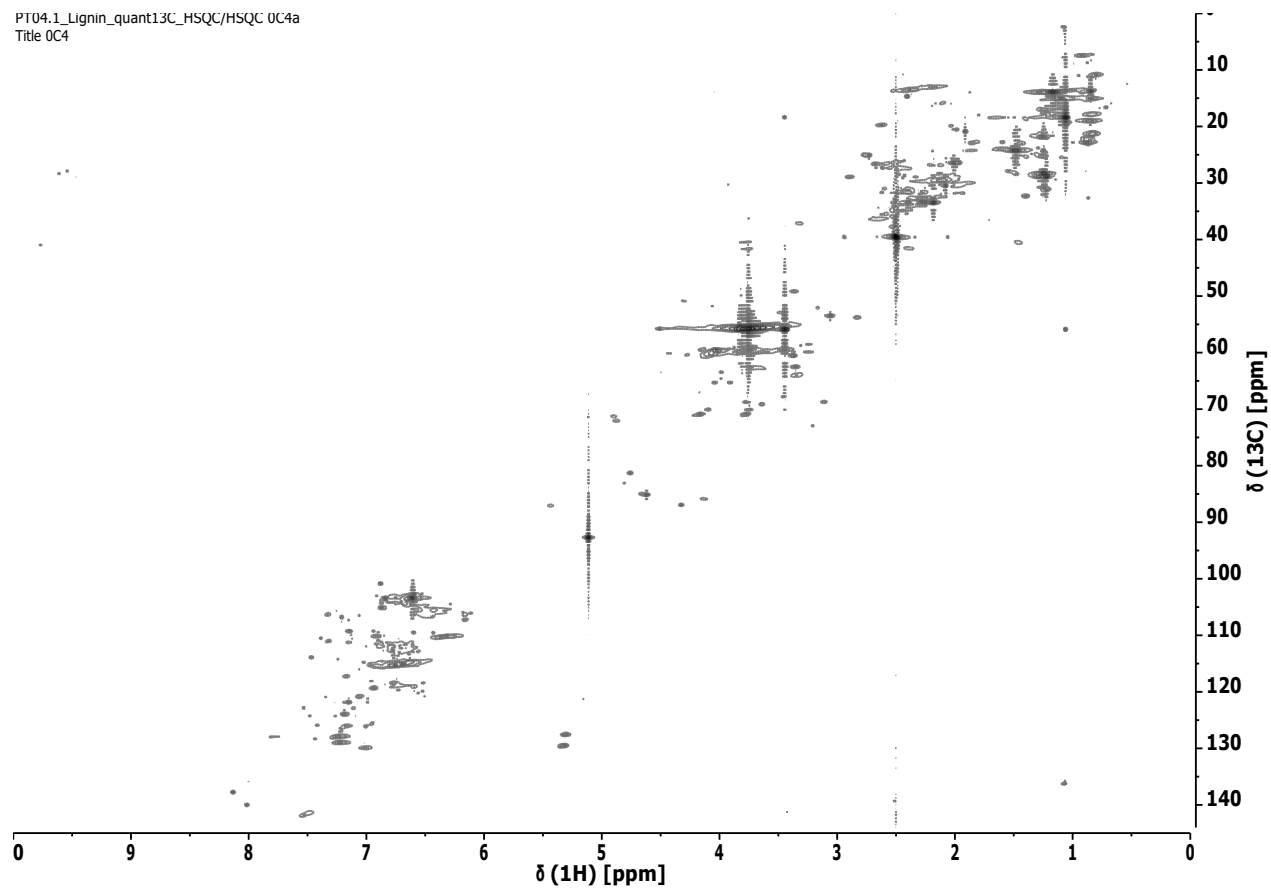


Figure S7: HSQC and quantitative  $^{13}\text{C}$  NMR spectra of lignin sample 0B6.



PT04.1\_Lignin\_quant13C\_HSQC/HSQC 0C4a  
Title 0C4



PT04.1\_Lignin\_quant13C\_HSQC/13C 0C4a  
Title 0C4

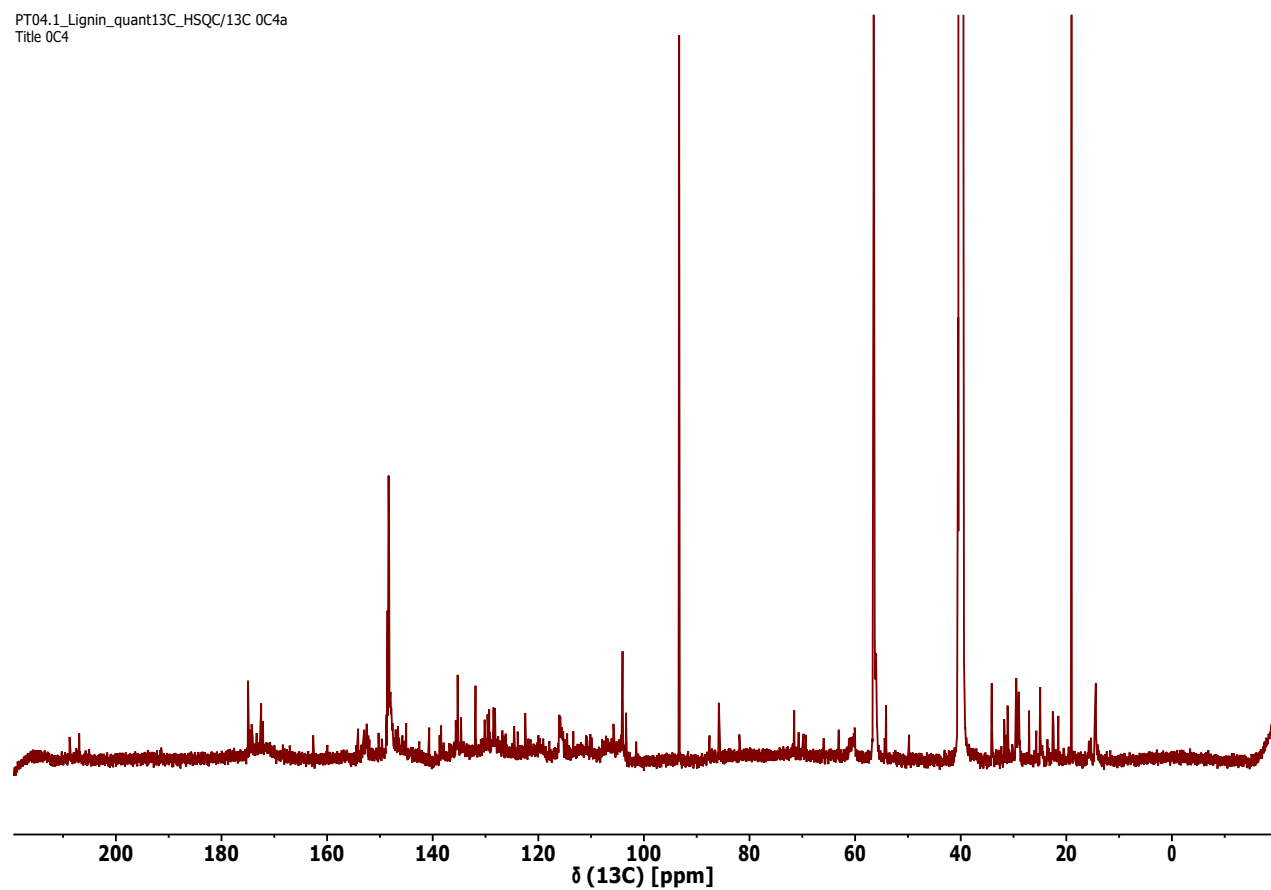
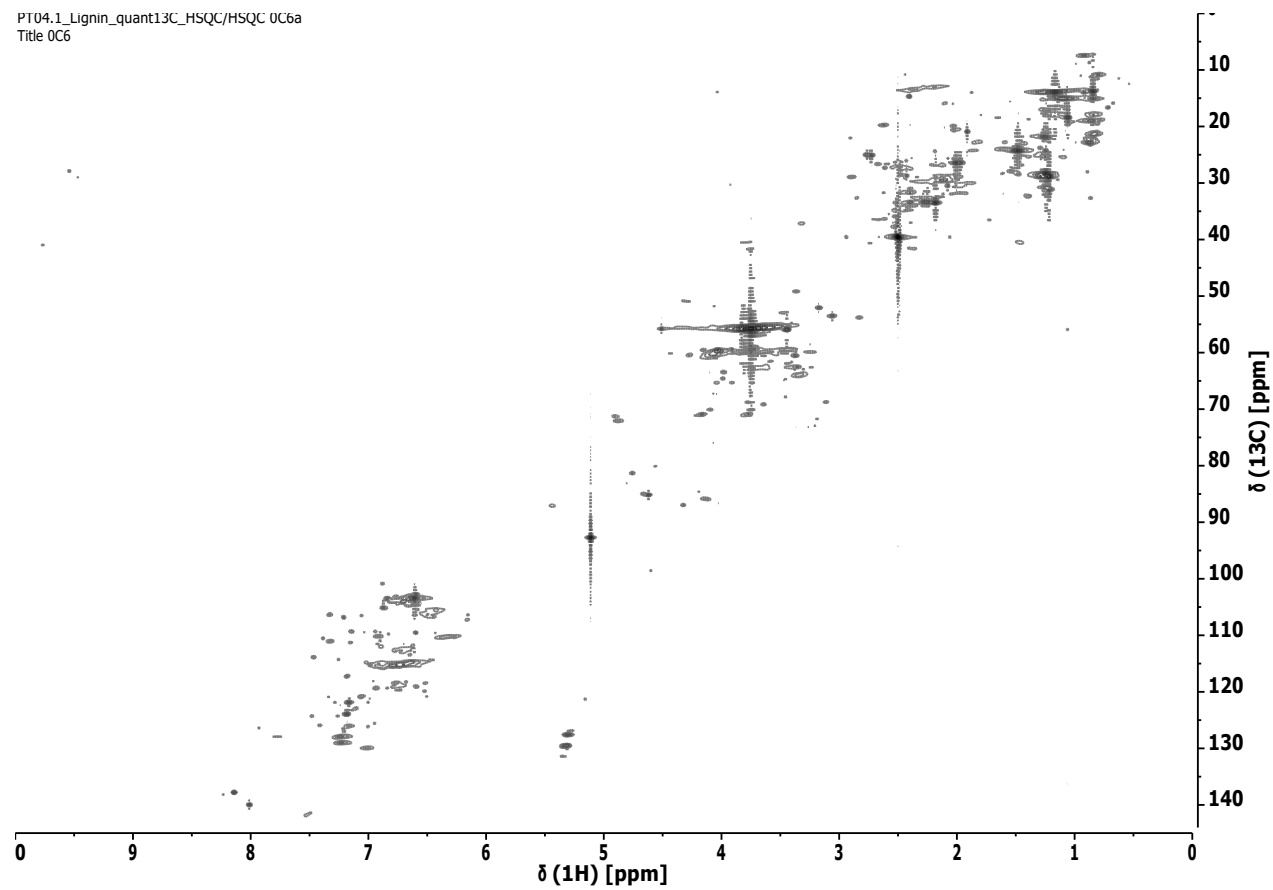


Figure S8: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 0C4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 0C6a  
Title 0C6



PT04.1\_Lignin\_quant13C\_HSQC/13C 0C6a  
Title 0C6

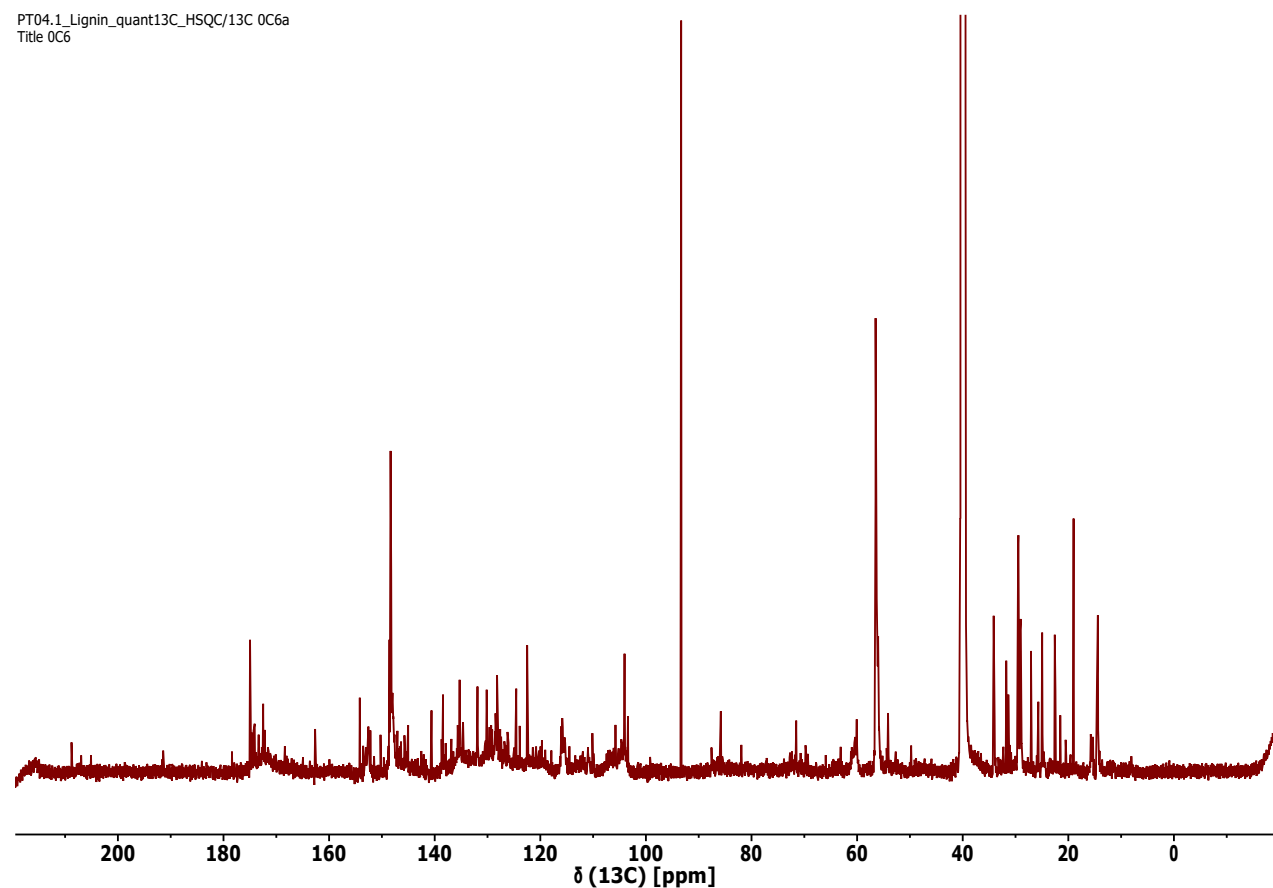
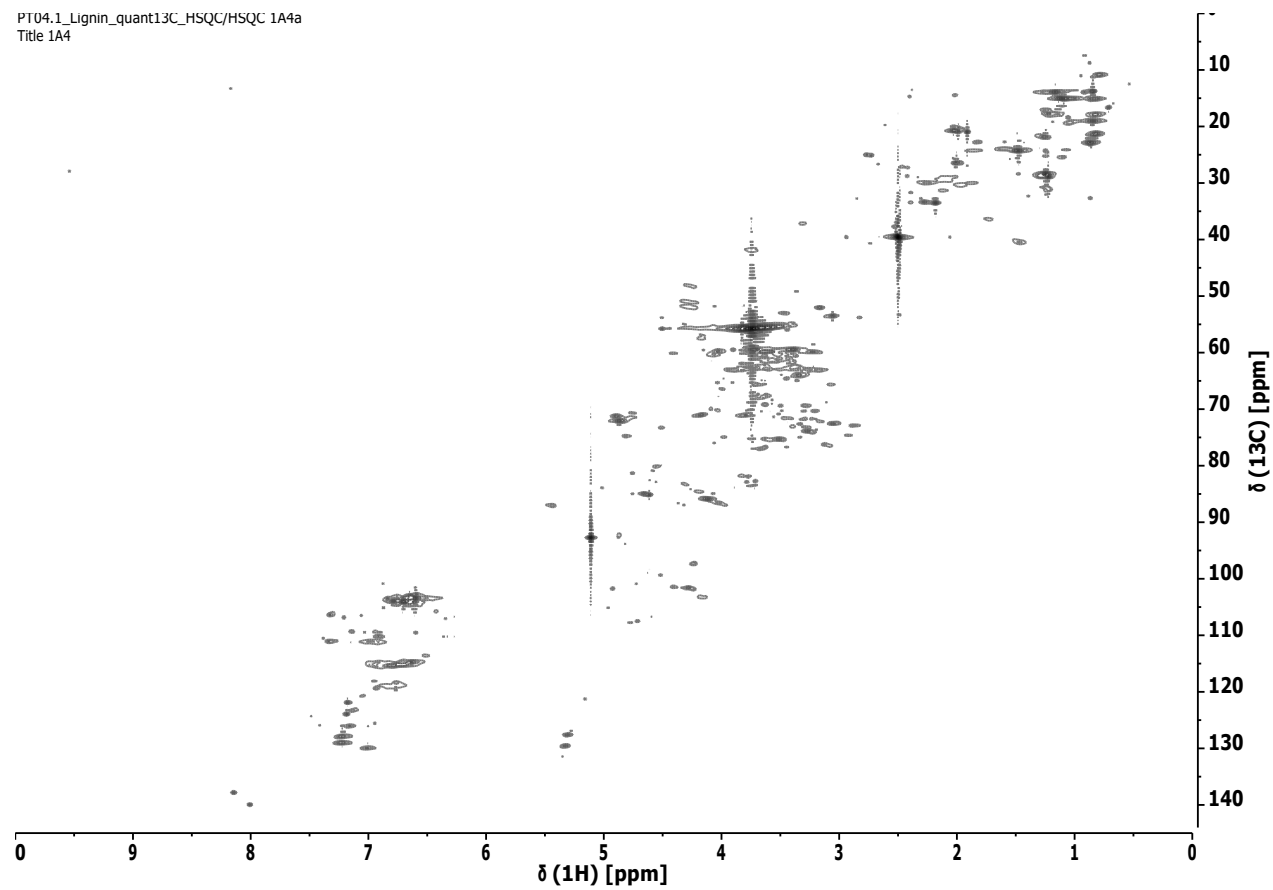


Figure S9: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 0C6.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1A4a  
Title 1A4



PT04.1\_Lignin\_quant13C\_HSQC/13C 1A4a  
Title 1A4

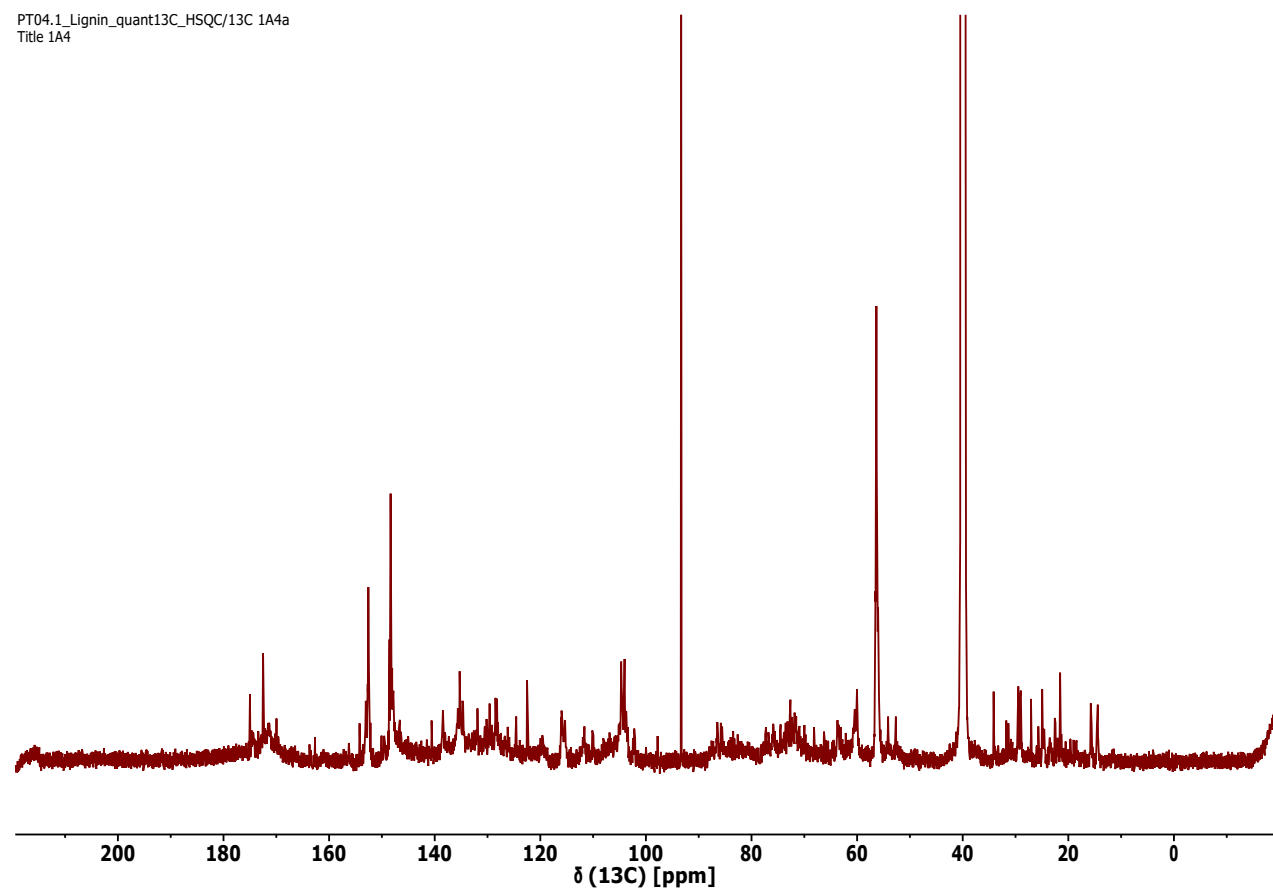
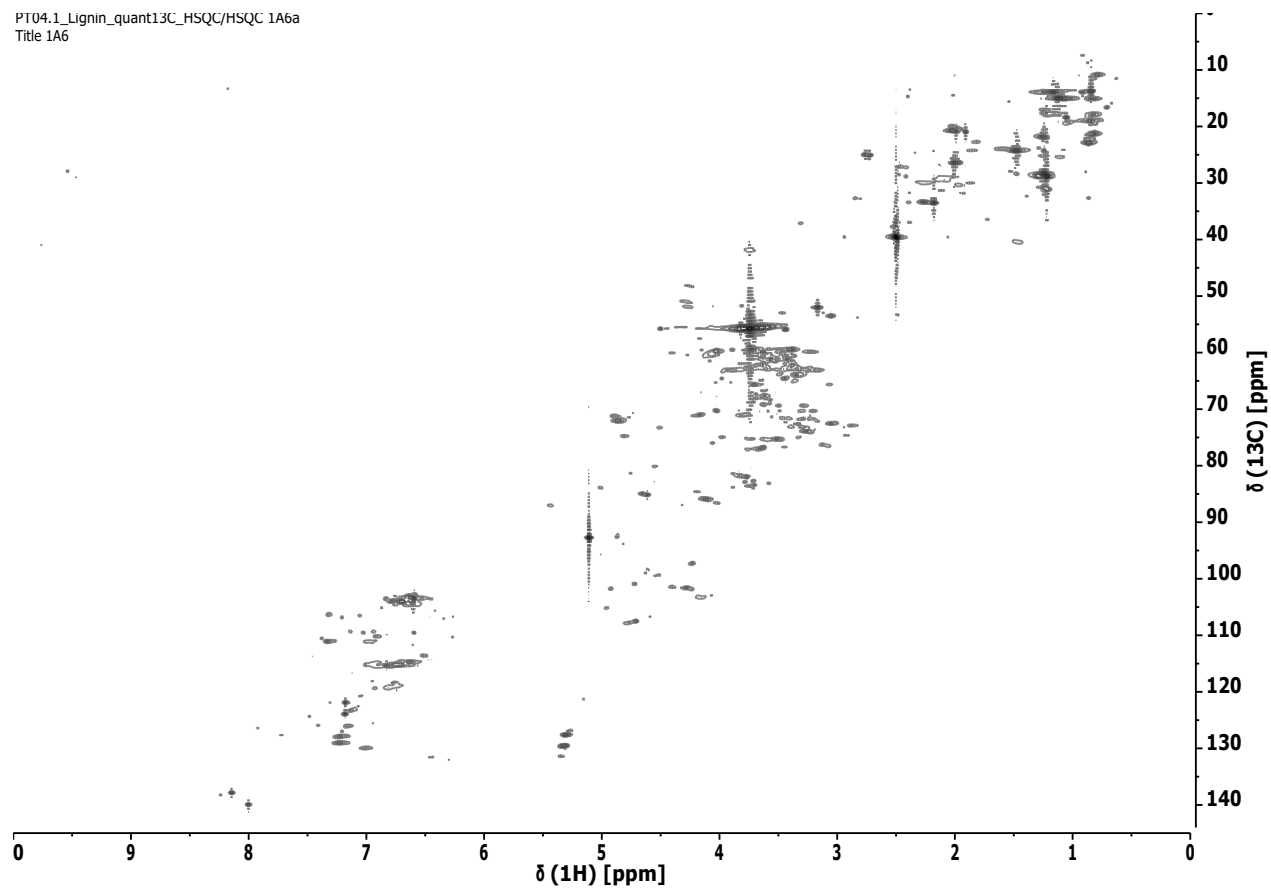


Figure S10: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 1A4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1A6a  
Title 1A6



PT04.1\_Lignin\_quant13C\_HSQC/13C 1A6a  
Title 1A6

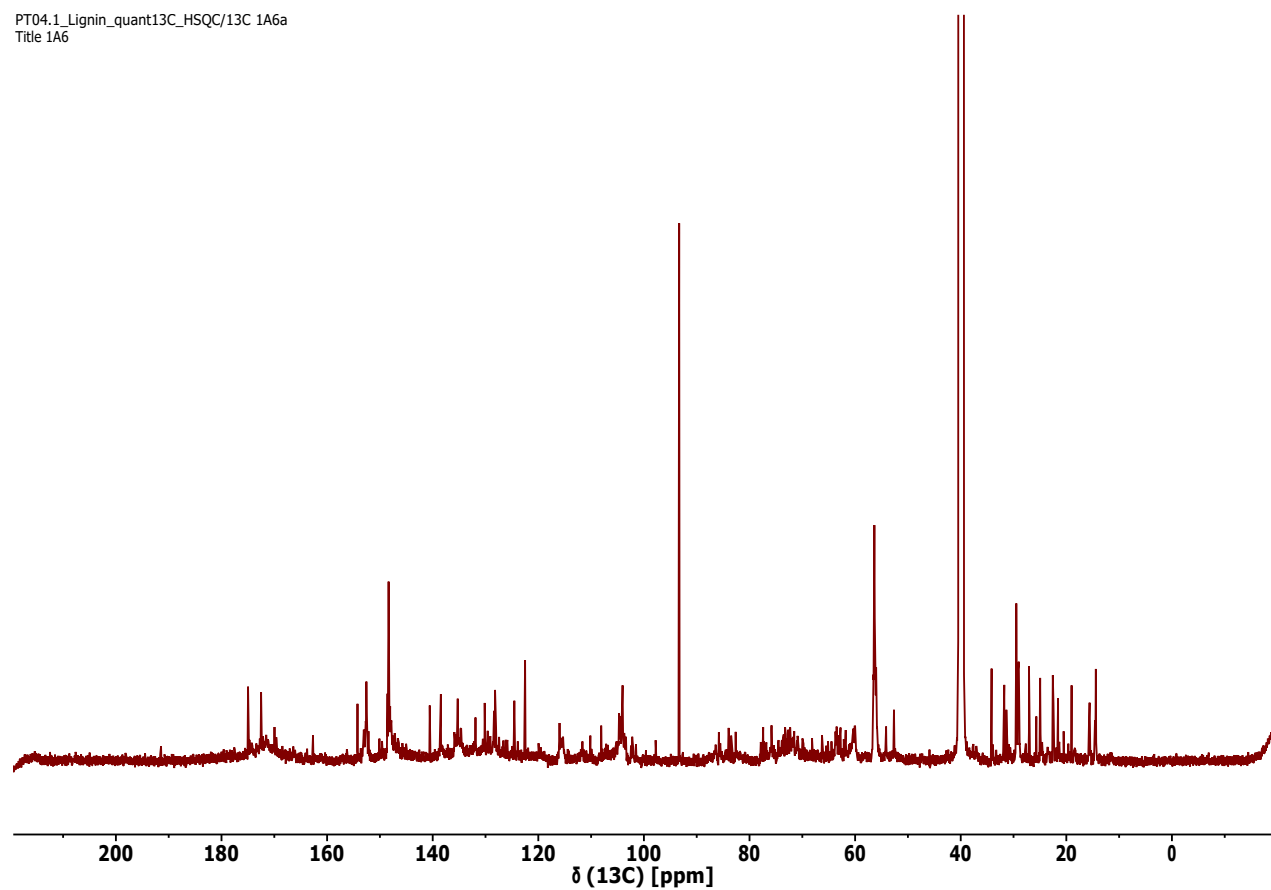
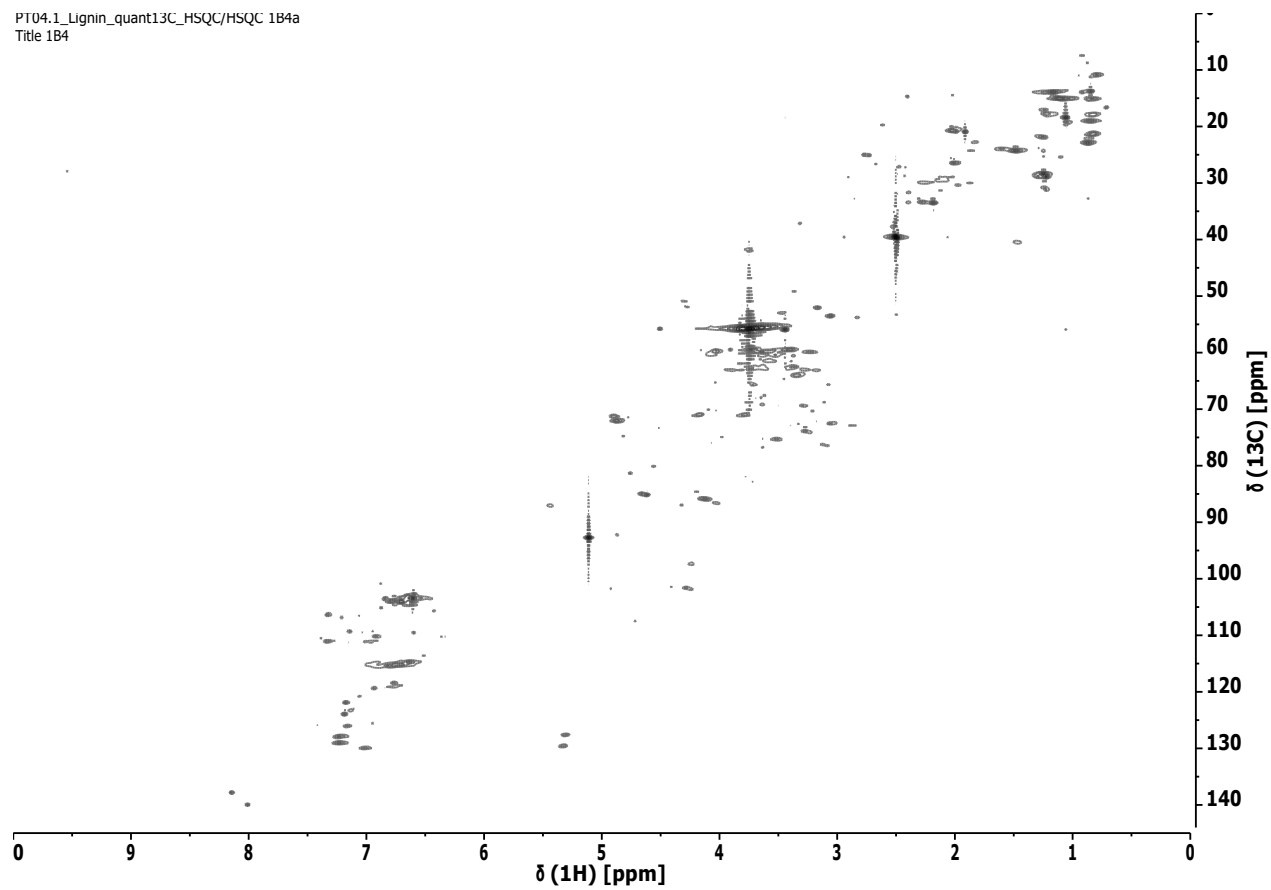


Figure S11: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 1A6.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1B4a  
Title 1B4



PT04.1\_Lignin\_quant13C\_HSQC/13C 1B4a  
Title 1B4

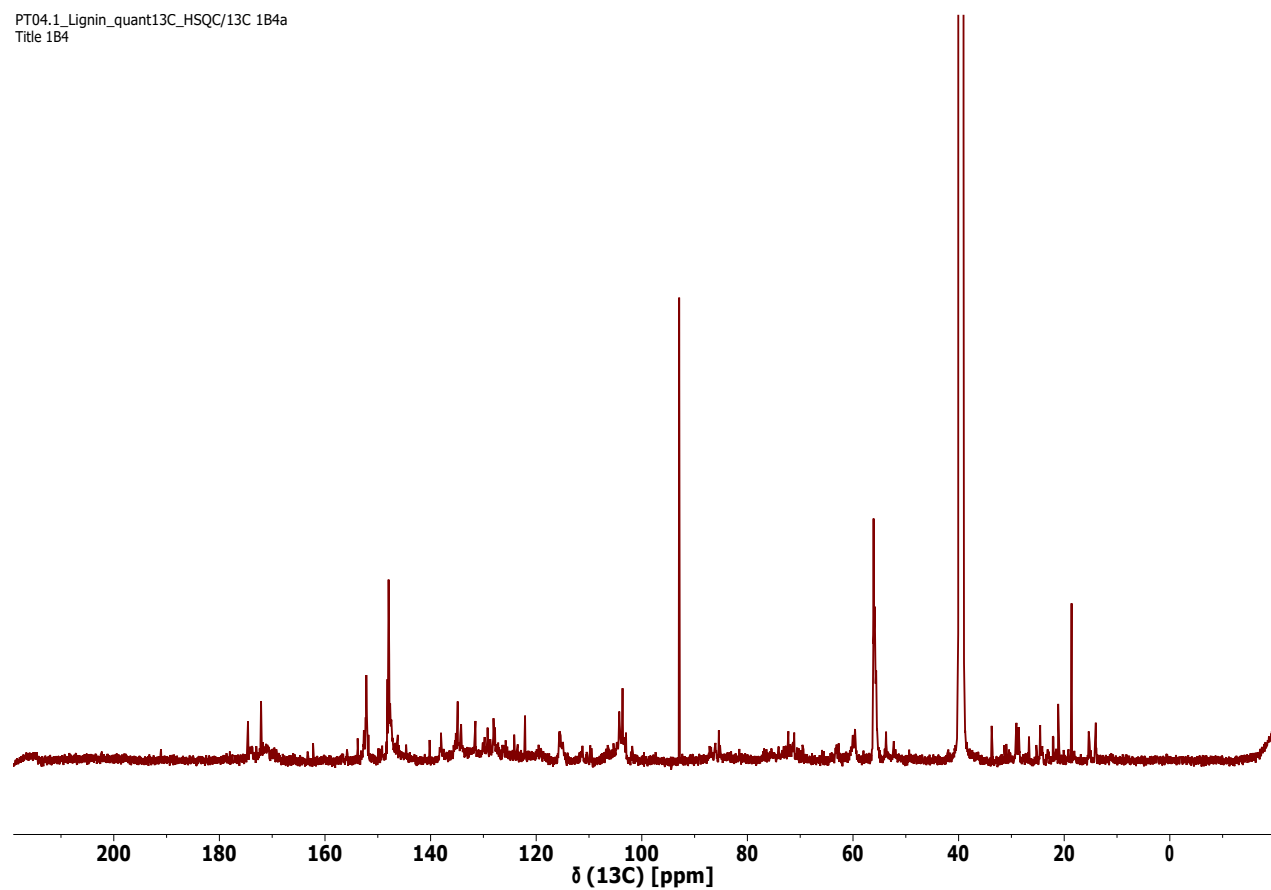
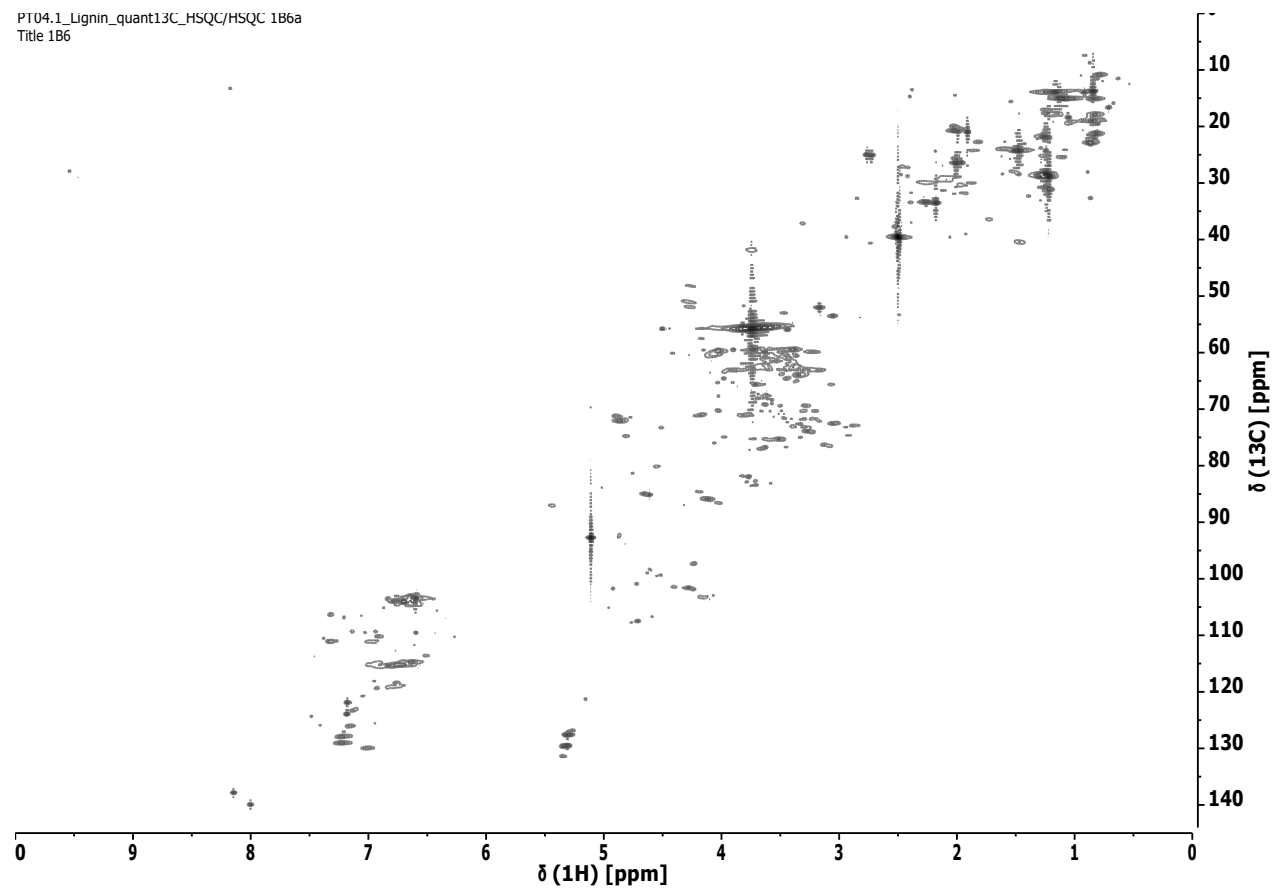


Figure S12: HSQC and quantitative  $^{13}\text{C}$  NMR spectra of lignin sample 1B4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1B6a  
Title 1B6



PT04.1\_Lignin\_quant13C\_HSQC/13C 1B6a  
Title 1B6

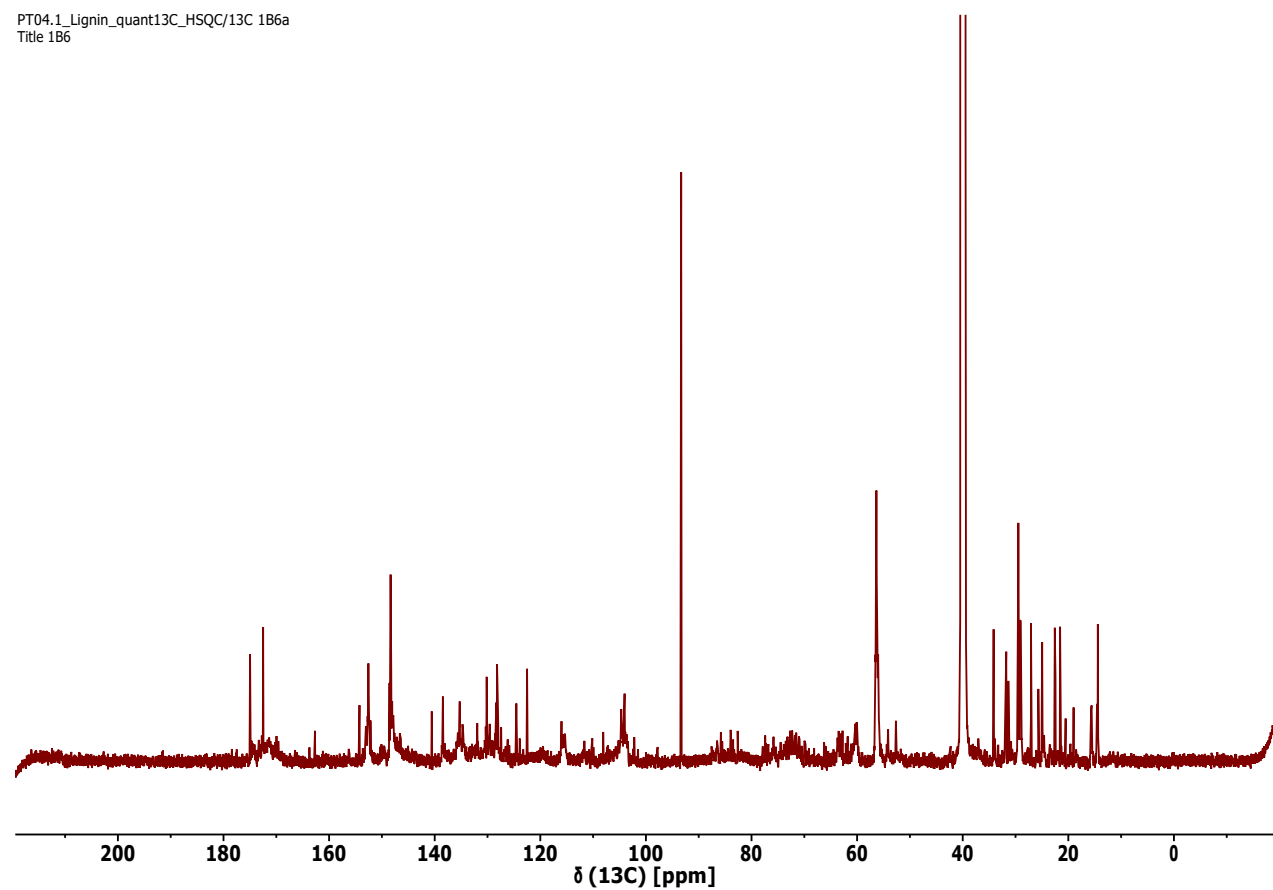
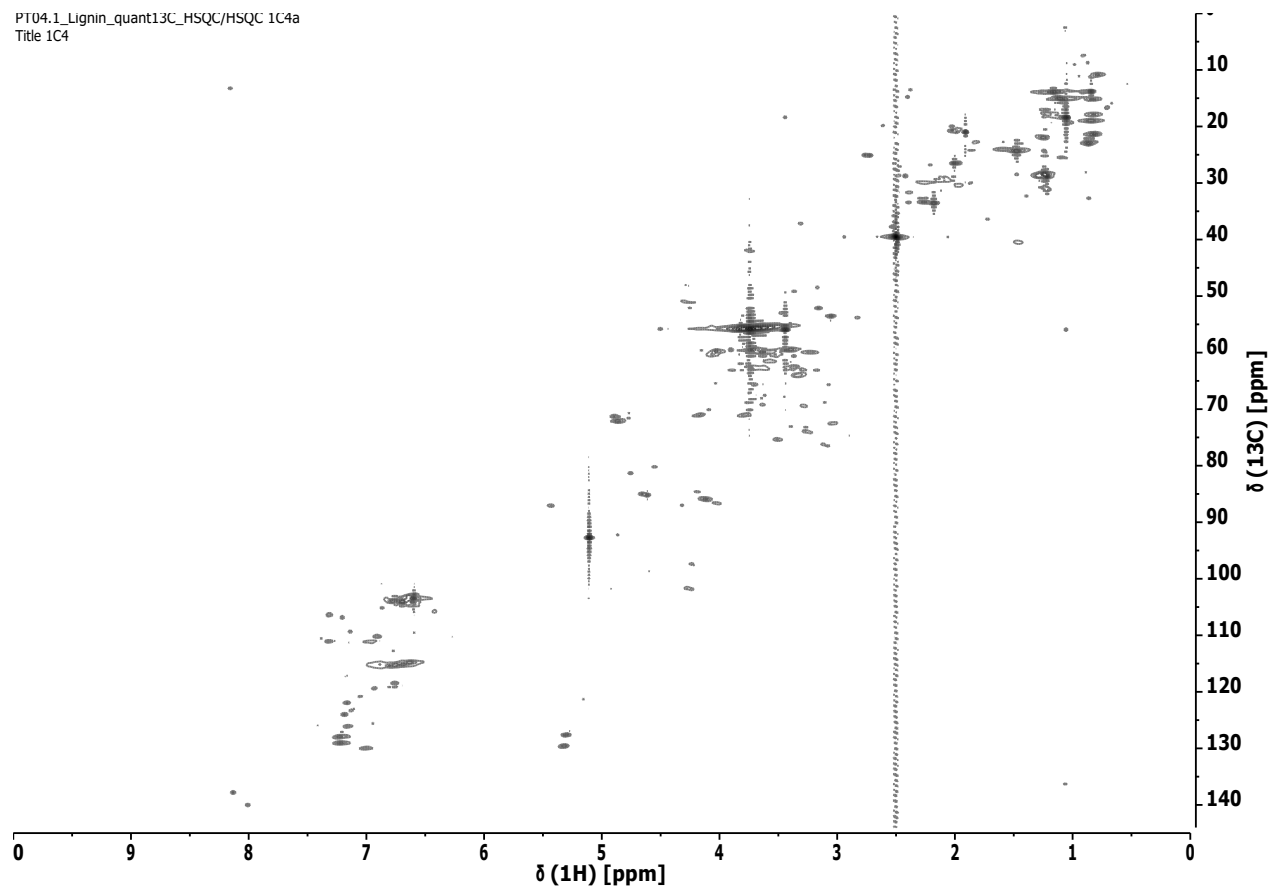


Figure S13: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 1B6.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1C4a  
Title 1C4



PT04.1\_Lignin\_quant13C\_HSQC/13C 1C4a  
Title 1C4

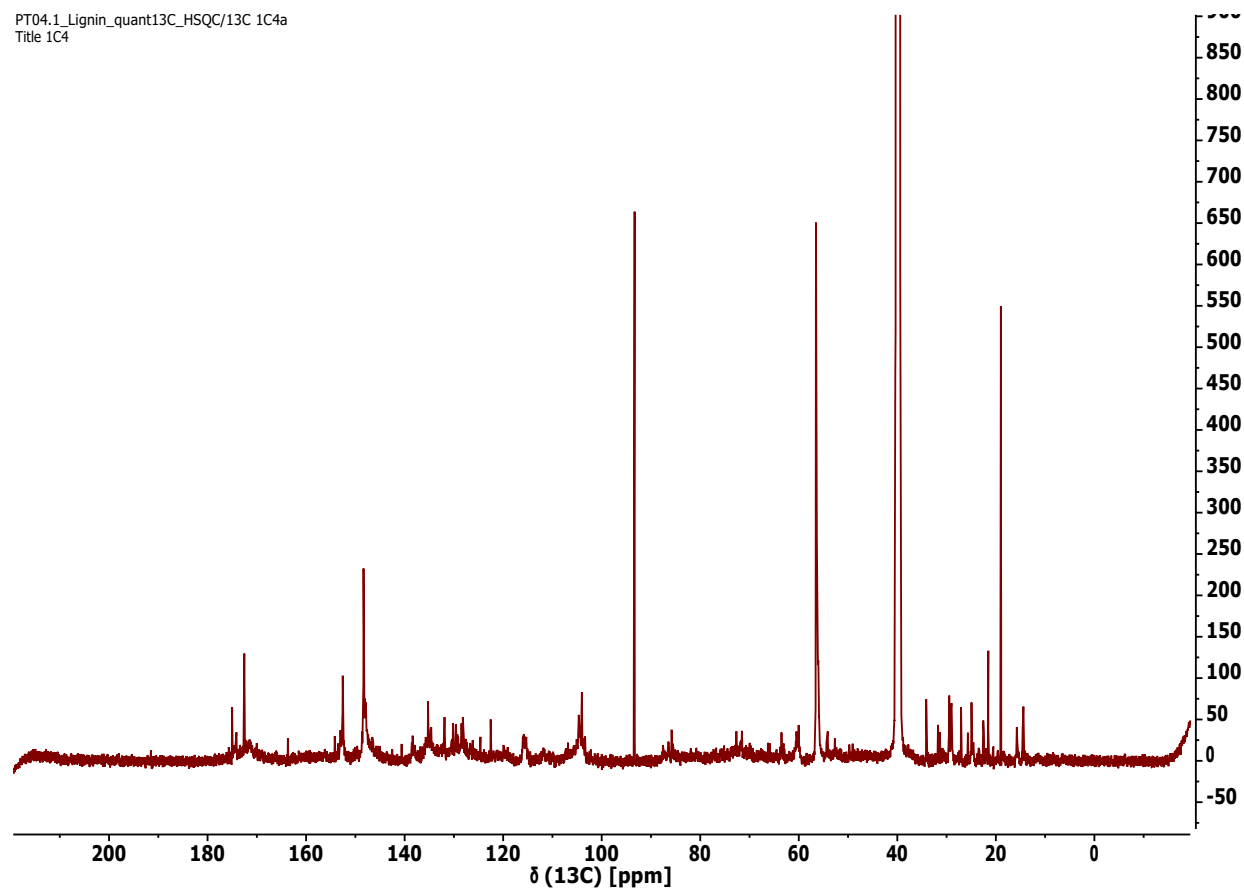
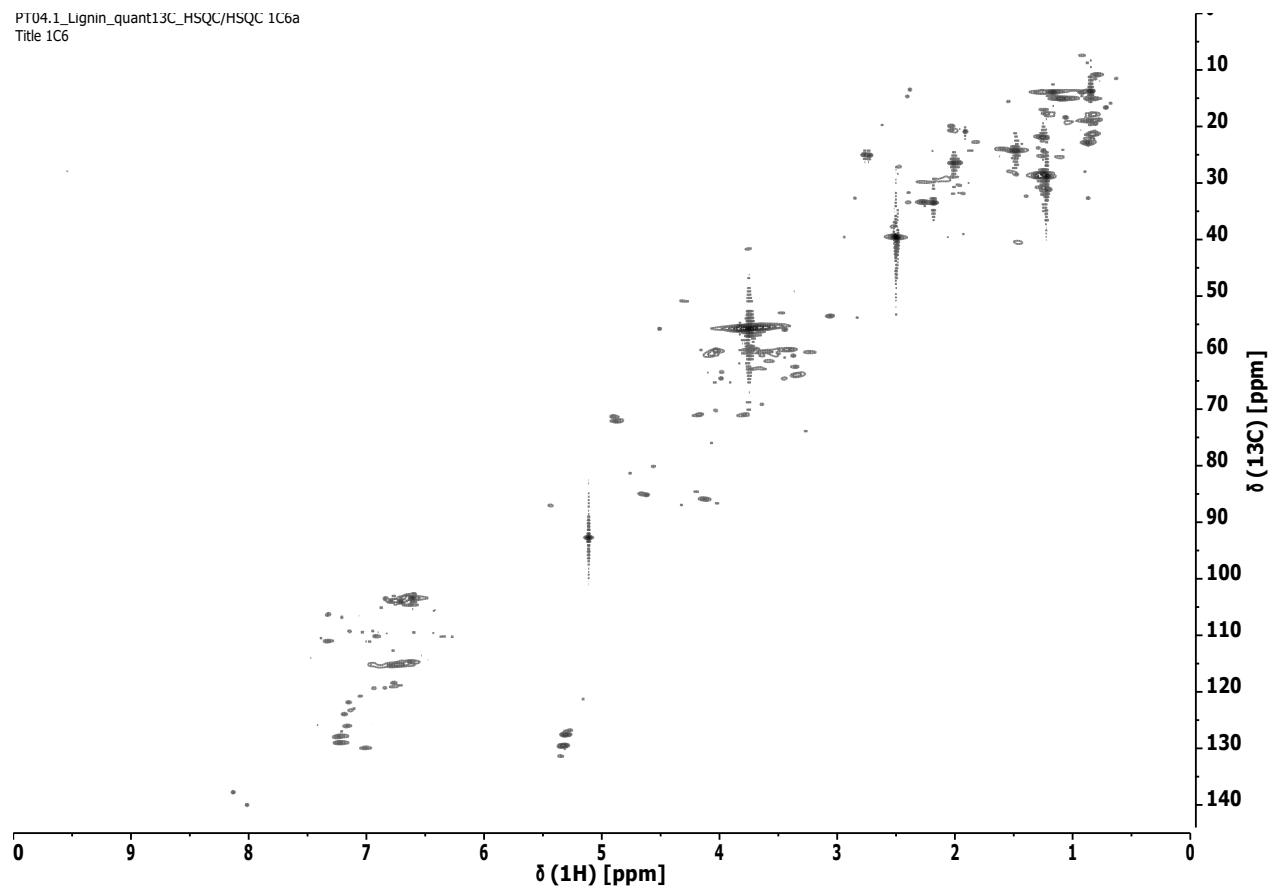


Figure S14: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 1C4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1C6a  
Title 1C6



PT04.1\_Lignin\_quant13C\_HSQC/13C 1C6a  
Title 1C6

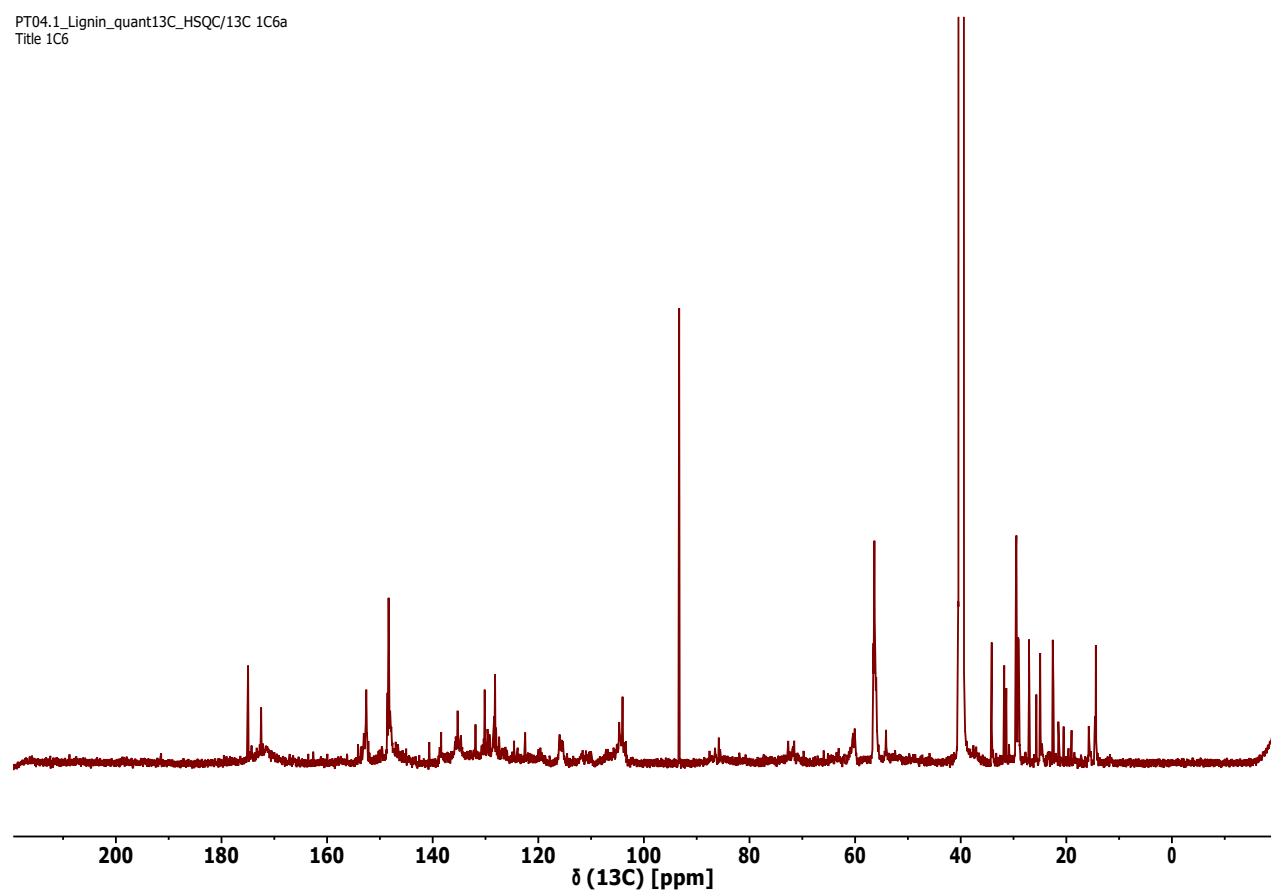
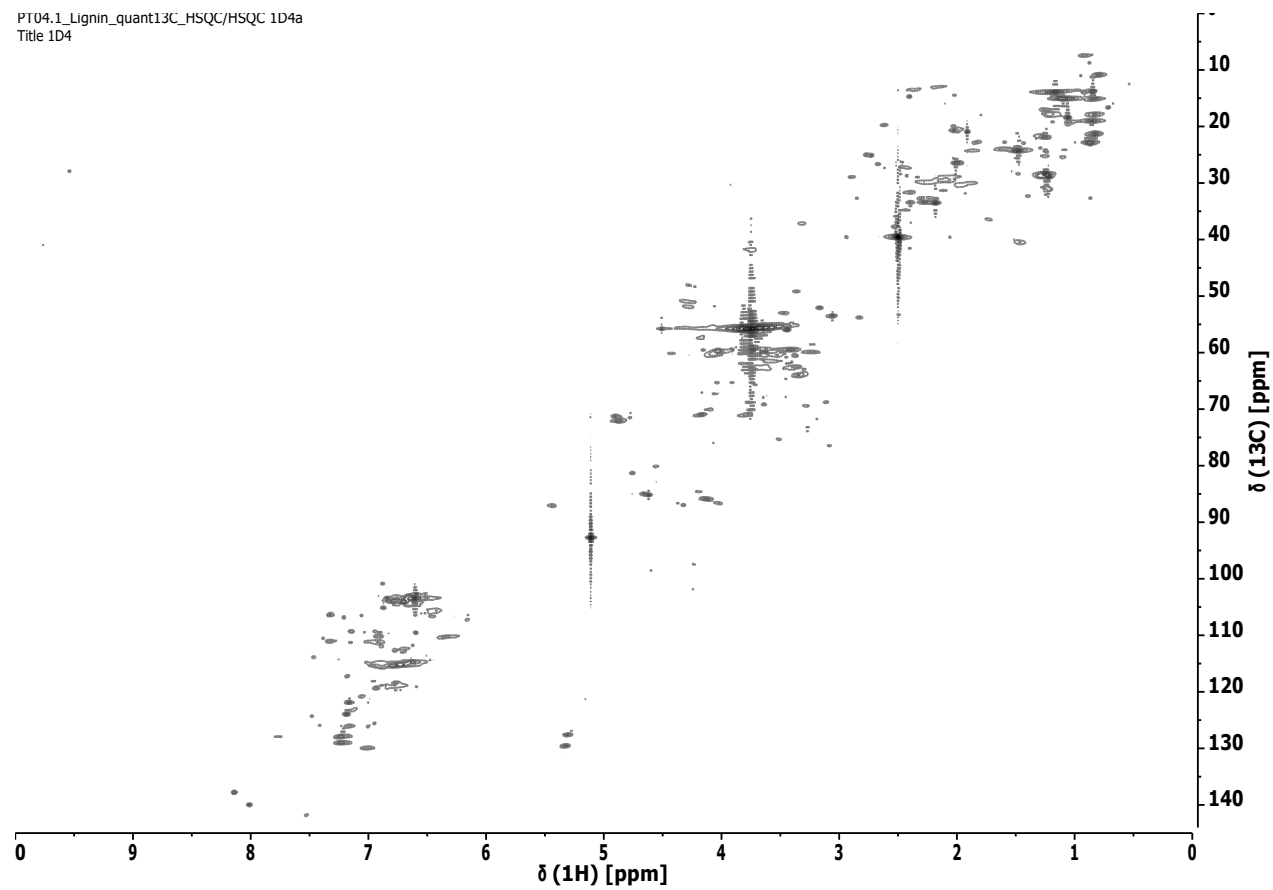


Figure S15: HSQC and quantitative  $^{13}\text{C}$  NMR spectra of lignin sample 1C6.



PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1D4a  
Title 1D4



PT04.1\_Lignin\_quant13C\_HSQC/13C 1D4a  
Title 1D4

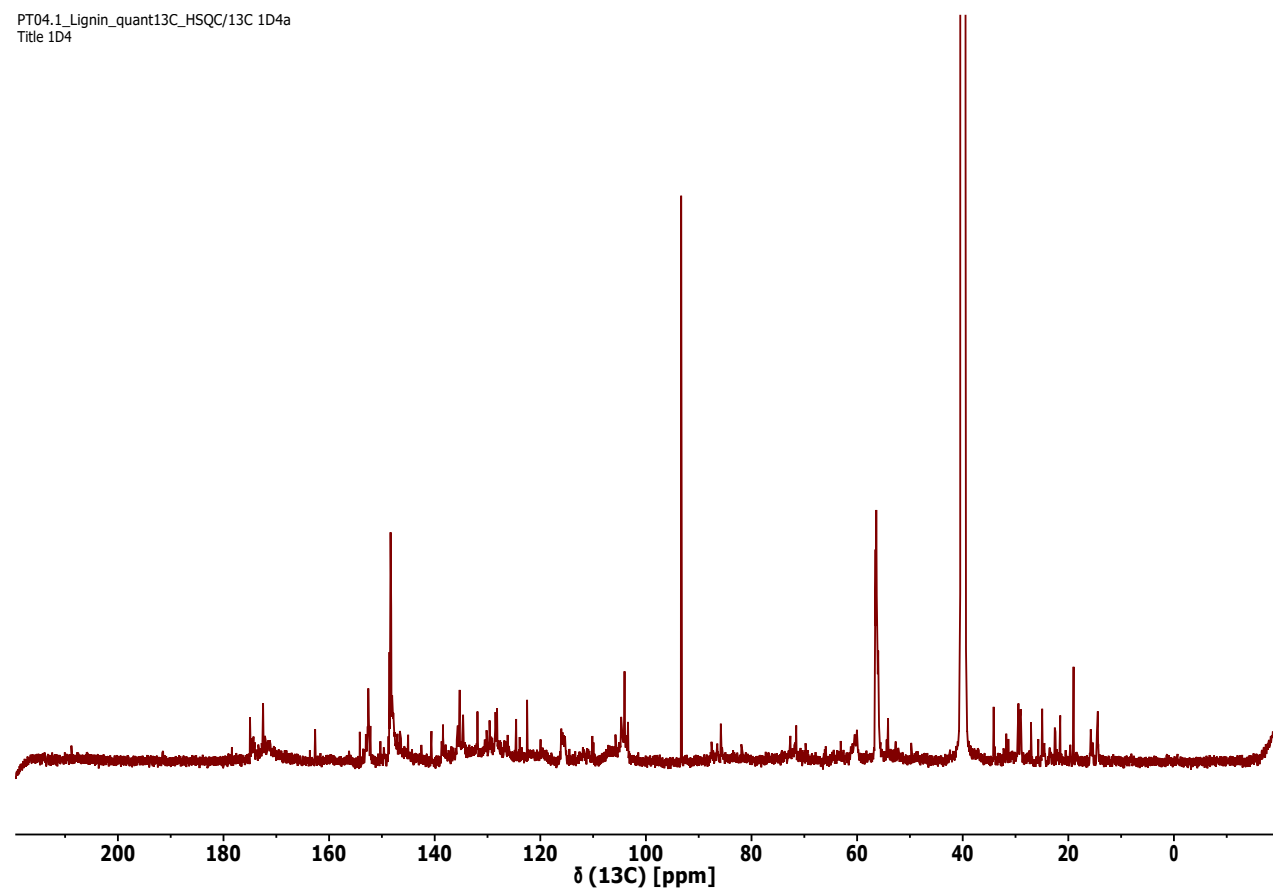
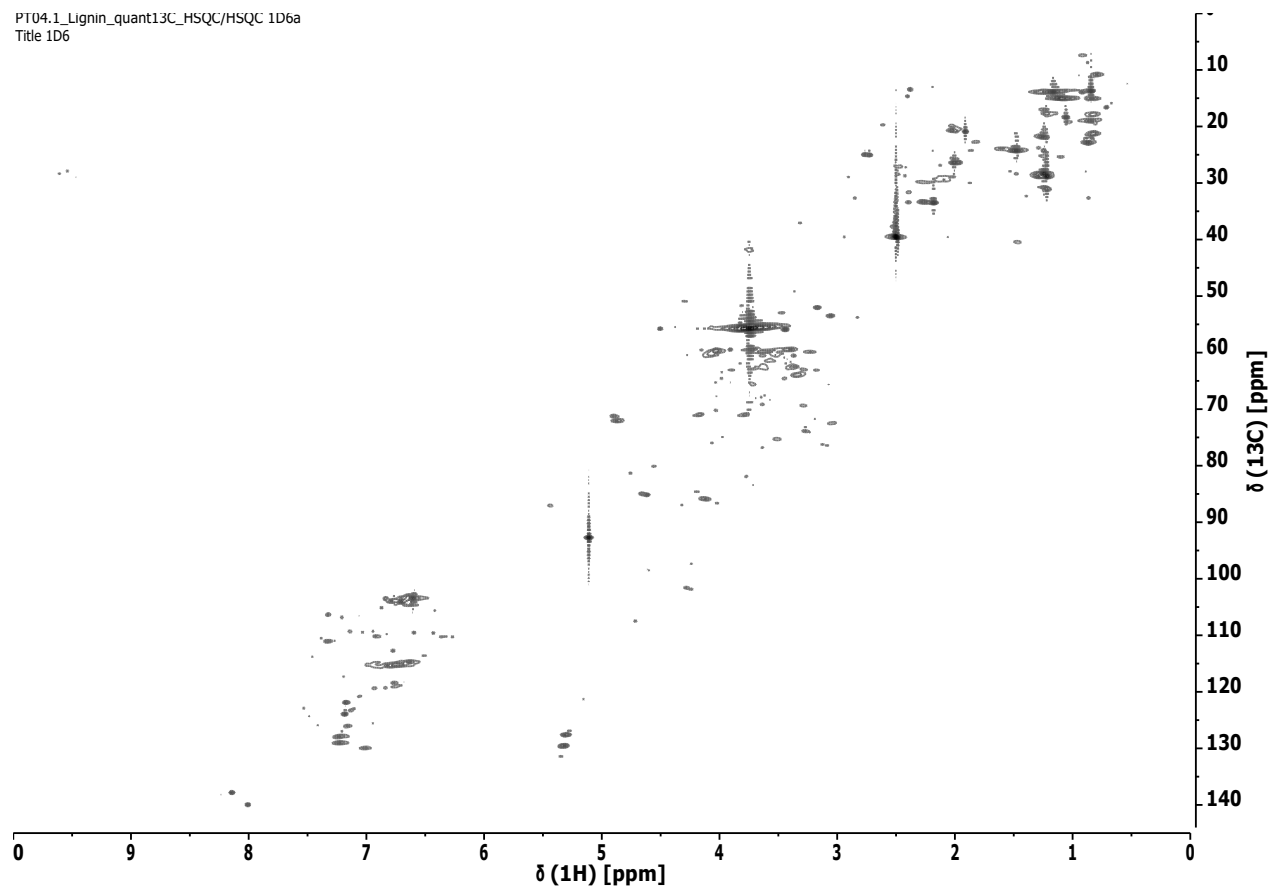


Figure S16: HSQC and quantitative  $^{13}\text{C}$  NMR spectra of lignin sample 1D4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 1D6a  
Title 1D6



PT04.1\_Lignin\_quant13C\_HSQC/13C 1D6a  
Title 1D6

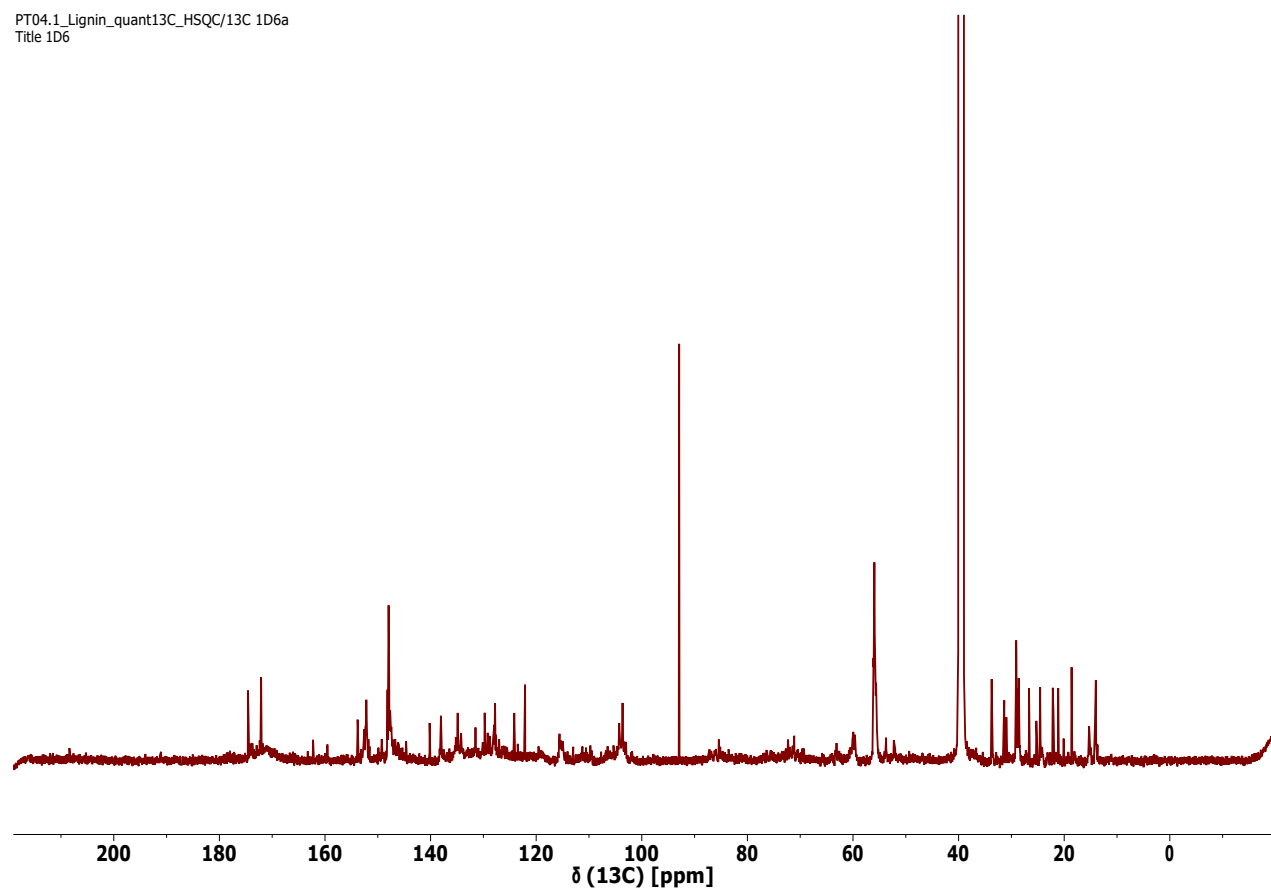
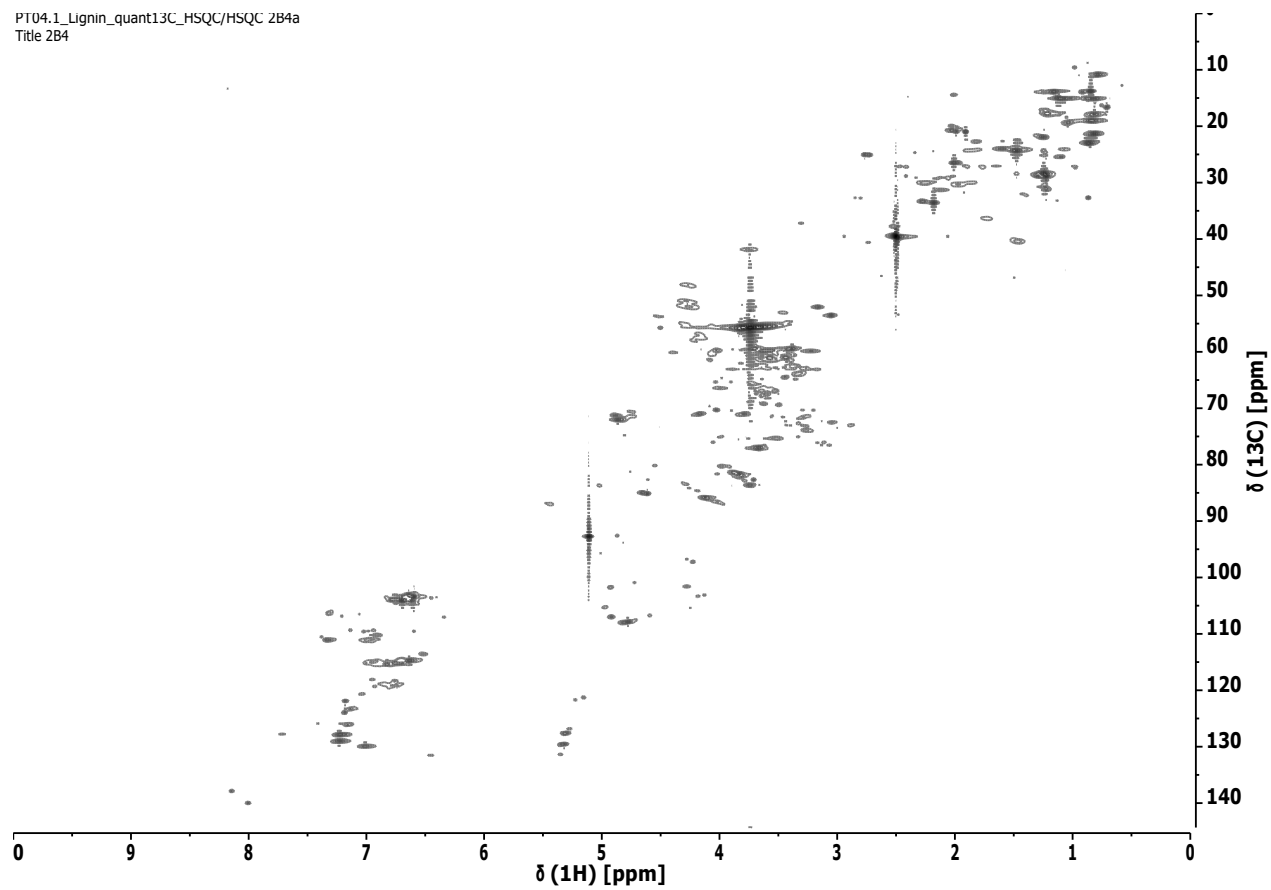


Figure S17: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 1D6.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 2B4a  
Title 2B4



PT04.1\_Lignin\_quant13C\_HSQC/13C 2B4a  
Title 2B4

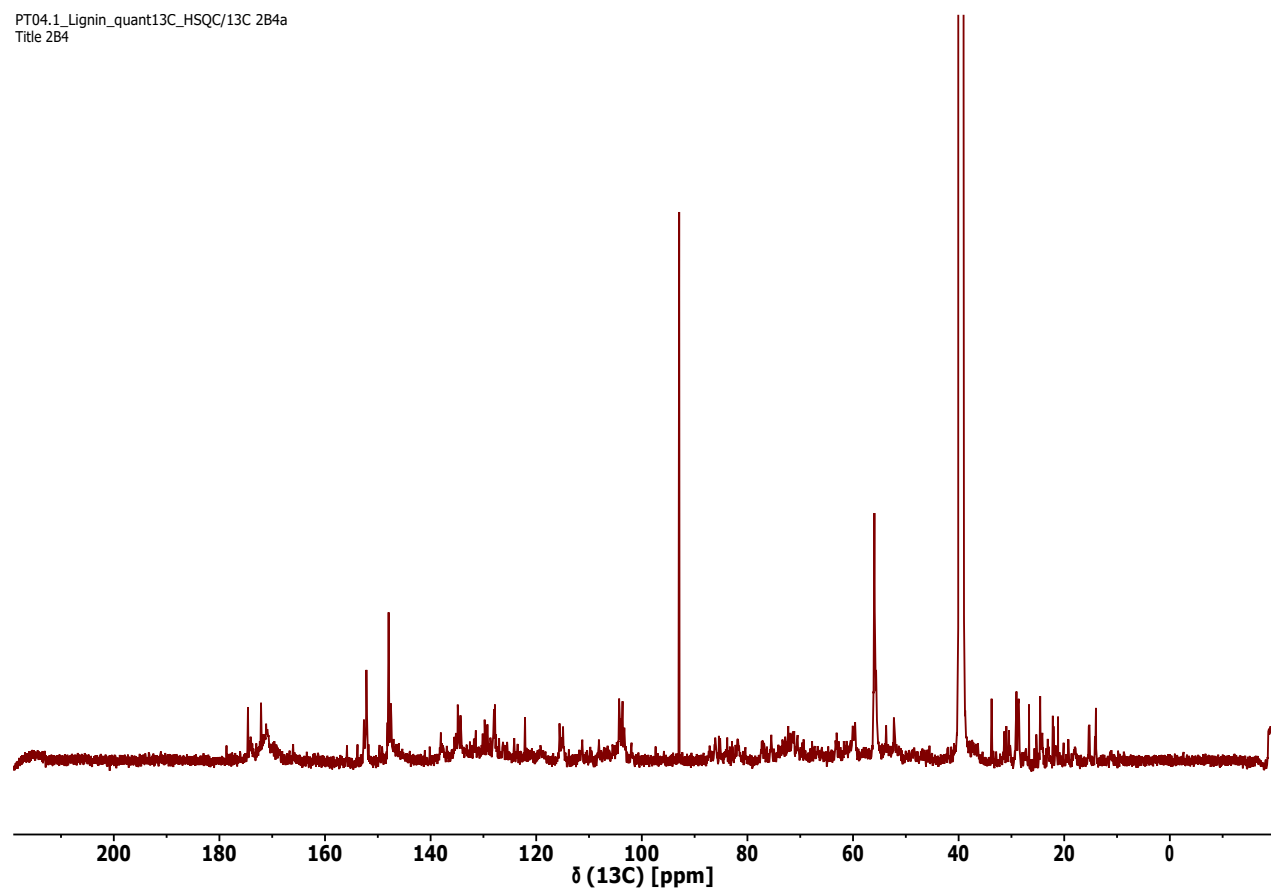
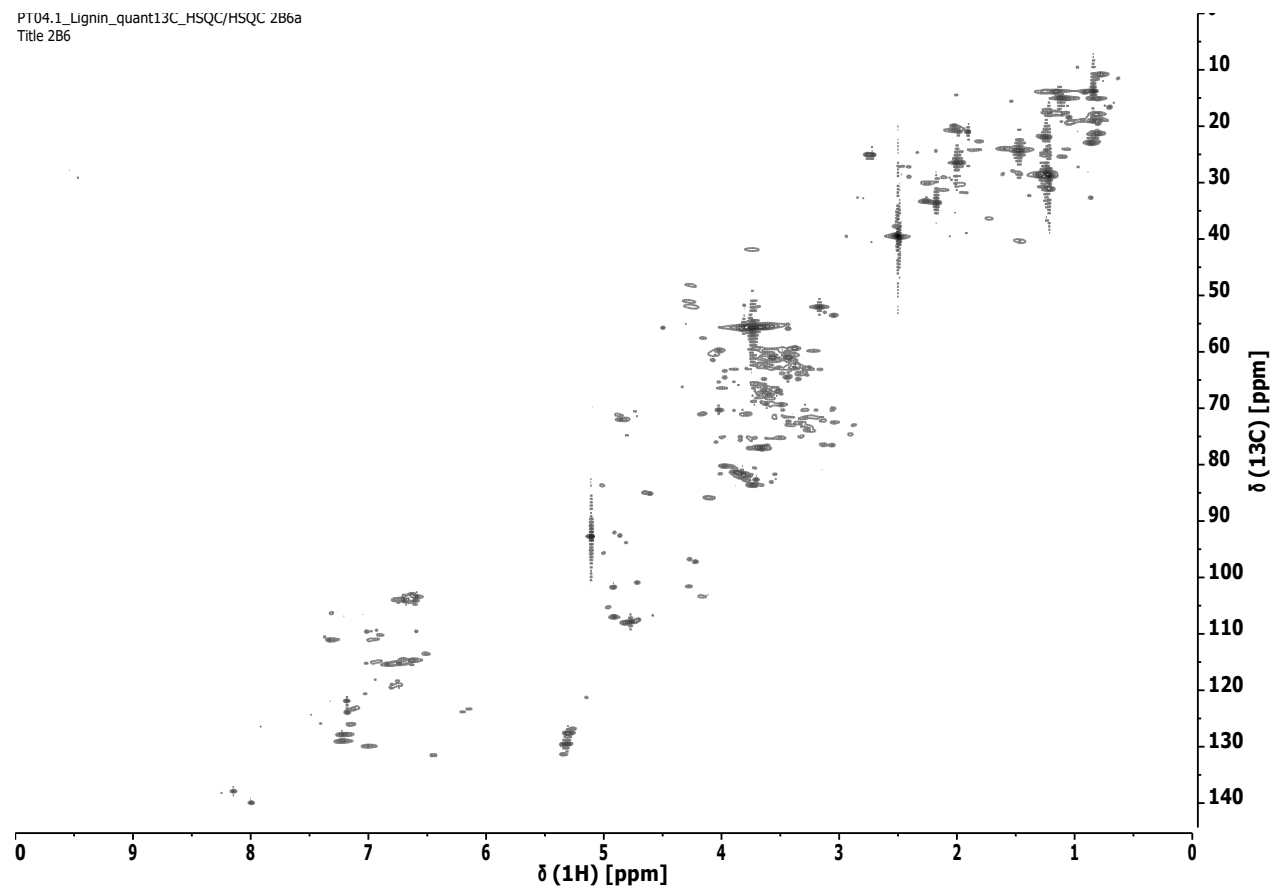


Figure S18: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 2B4.

PT04.1\_Lignin\_quant13C\_HSQC/HSQC 2B6a  
Title 2B6



PT04.1\_Lignin\_quant13C\_HSQC/13C 2B6a  
Title 2B6

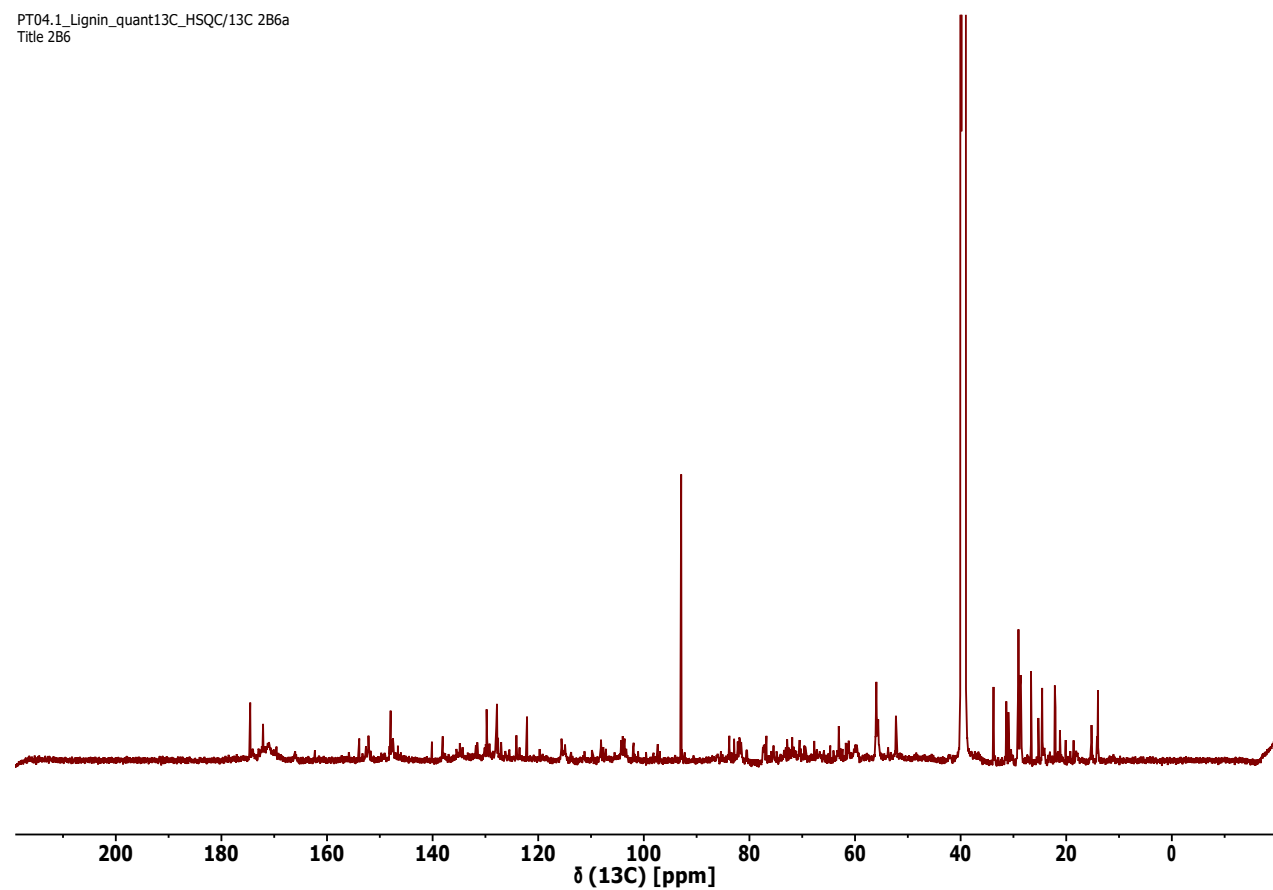


Figure S19: HSQC and quantitative <sup>13</sup>C NMR spectra of lignin sample 2B6.