Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

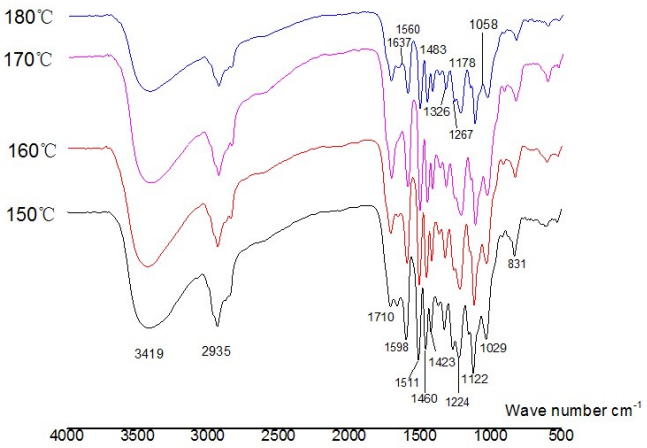

Figure S1. FT-IR spectra of lignin fractions

Table S1. Assignments and relative intensities of important signal from lignin fractions

Assignment	Wavenumber cm^{-1}	L_{150}	L_{160}	L_{170}	L_{180}
Stretching vibration of -OH	3400	0.82	0.84	0.89	0.87
Vibration of C-H in methyl and Methylene	2930	0.81	0.80	0.77	0.83
Stretching vibration of non-conjugate C=O	1715	0.70	0.74	0.69	0.83
	1600	0.88	0.86	0.87	0.89
Aromatic skeleton	1512	1.0	1.0	1.0	1.0
	1423	0.85	0.84	0.86	0.9
Deformation vibration of C-H	1460	0.94	0.94	0.96	0.97
Syringyl	1326	0.83	0.81	0.84	0.89
C-O of Guaiacyl	1268	0.94	0.93	0.91	0.95
Aromatic methyl ether linkage	1223	0.99	1.04	1.03	1.03
Deformation vibration of C-H in syringyl	1122	0.99	1.14	1.13	1.08
C-H in aromatic ring of Guaiacyl and syringyl	1030	0.88	0.89	0.86	0.92
Aromatic C-H deformation out of plane	831	0.41	0.38	0.35	0.44

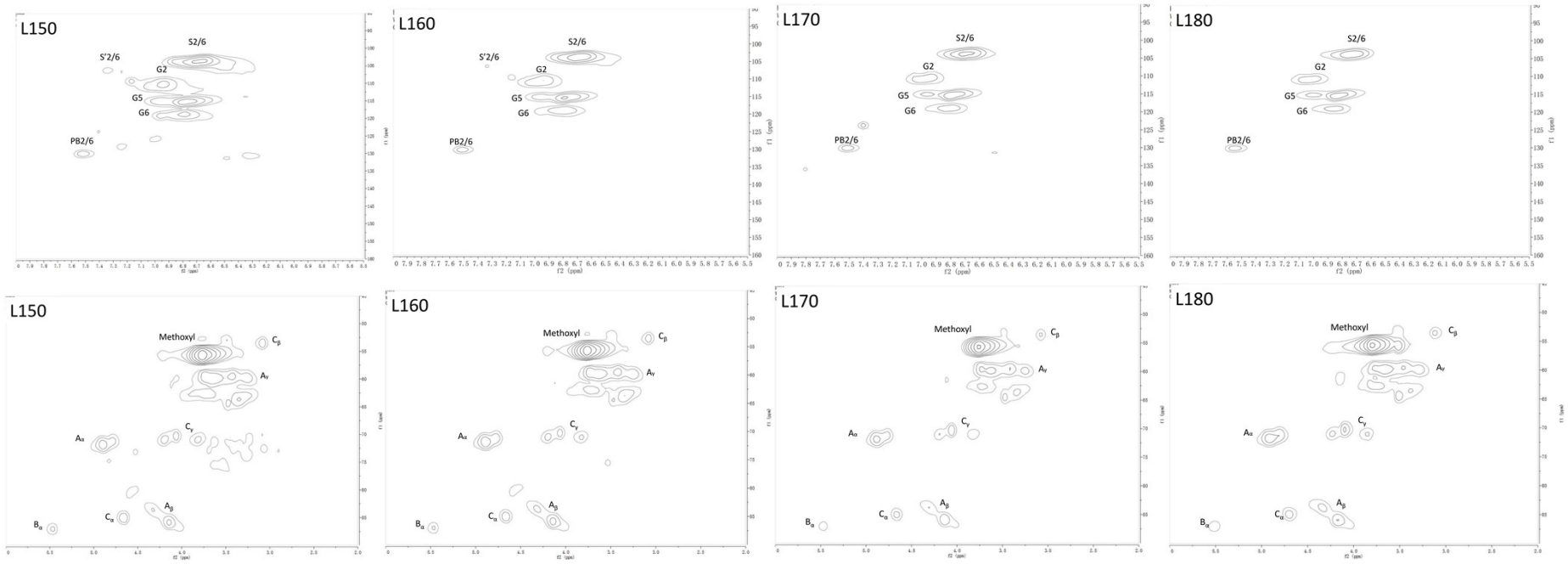

Figure S2. Aromatic regions and aliphatic regions in HSQC spectra of the isolated lignin samples from *Broussonetia papyrifera*: (A) β-O-4 alkyl-aryl ethers; (B) phenylcoumarane; (C) resinols; (PB) p-hydroxybenzoate substructures; (G) guaiacyl units; (S) syringyl unit; (S') oxidized syringyl units with a Cα ketone.