ELECTRONIC SUPPLEMENTARY INFORMATION

Tuning ester derivatives of organosolv *vs* technical lignin for improved thermoplastic materials

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CONTENT

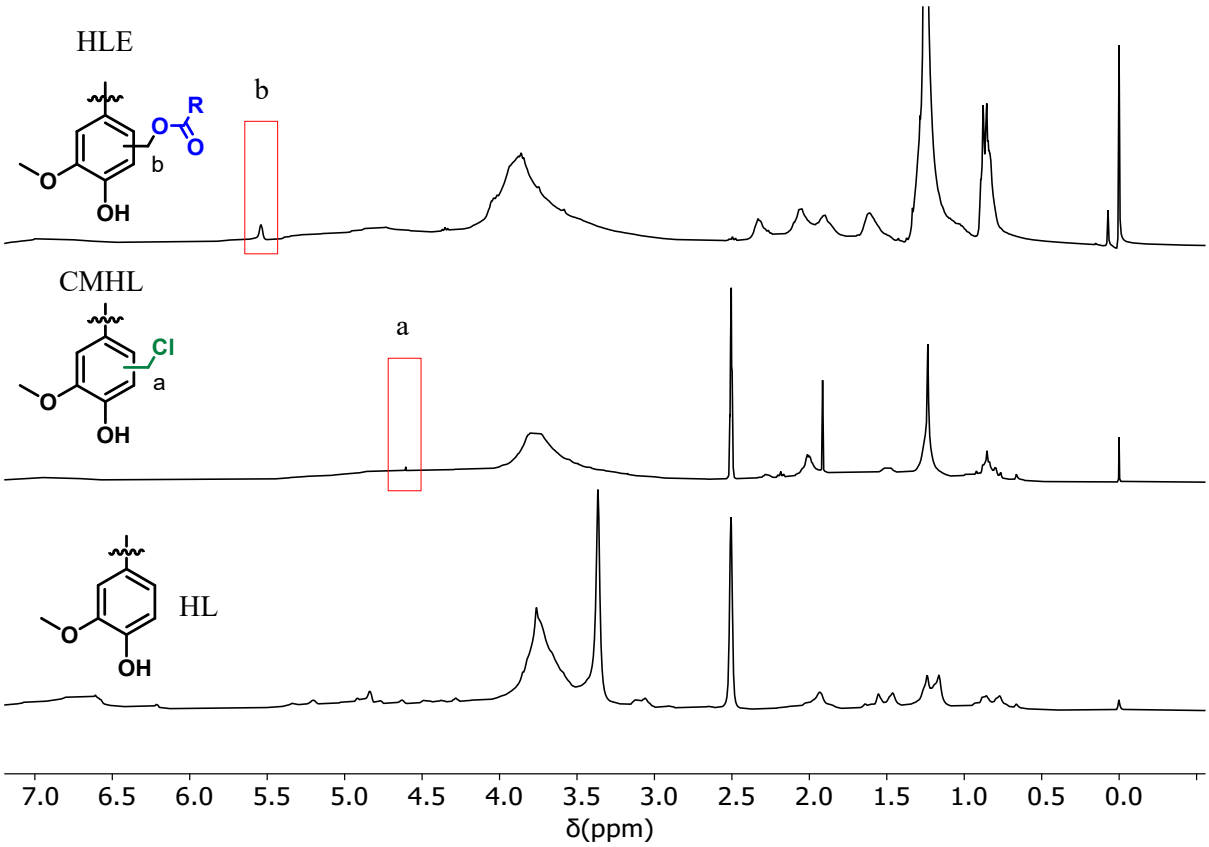

Figure S1. ^{1}H NMR spectra of hydrolysis lignin (HL), chloromethylated hydrolysis lignin (CMHL), and hydrolysis lignin esters (HLE).

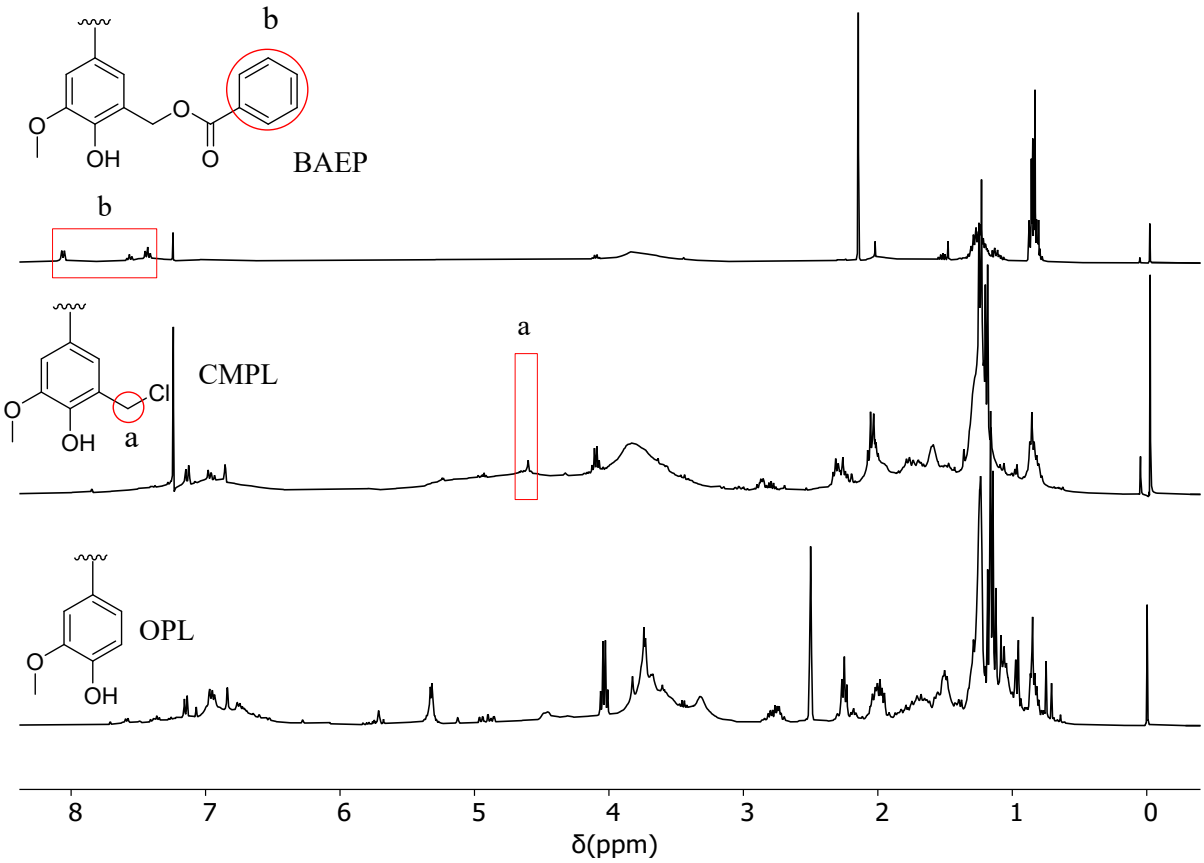

Figure S2. ^{1}H NMR spectra of organosolv pine lignin (OPL), chloromethylated pine lignin (CMPL), and benzoic acid ester pine (BAEP)**.**

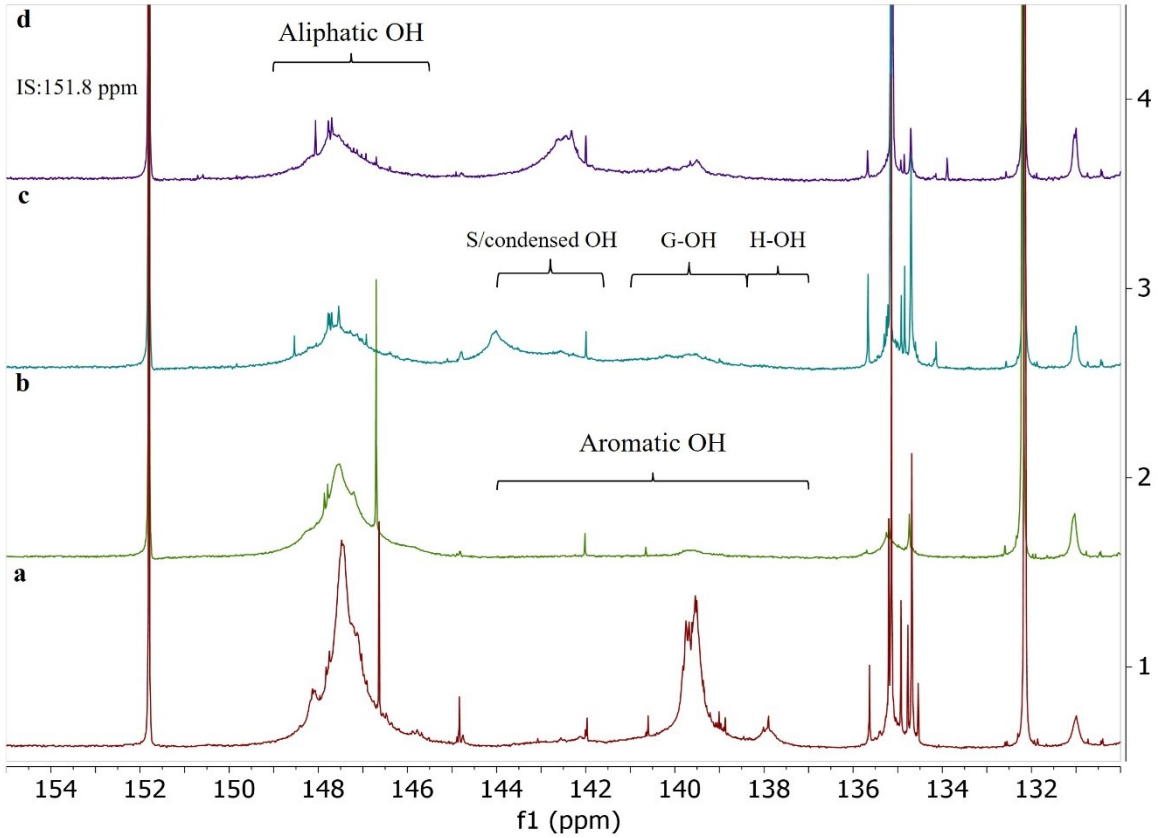

Figure S3. ^{31}P NMR spectra of organosolv pine lignin (a), C16 ester modified OH of pine lignin (b), chloromethylated pine lignin (c), and benzoic acid ester pine (d)**.**

Table S1. The tensile properties of neat PLA and its composites with 30 wt% lignin esters (HLE, OHLE_C16, and BAEP)

Specimen	Maximum load (N)	Tensile stress at maximum load (MPa)	Tensile extension at Maximum load (mm)	Modulus of elasticity (MPa)
PLA film	15.2±2.0	27±9	2.5±0.2	1200±230
PLA+HLE (30%)	8.5±2.0	29±3	4.5±1	1940±550
PLA+OHLE_C16 (30%)	10.3±0.5	20±0.8	5±0.5	830±60
PLA+BAEP (30%)	7.5±1.0	15±1.3	4±1	560±80