Supplementary Materials: Properties of Ramie (*Boehmeria nivea* (L.) Gaudich) Fibers Impregnated with Non-Isocynate Polyurethane Resins Derived from Lignin

Supplementary of Figures

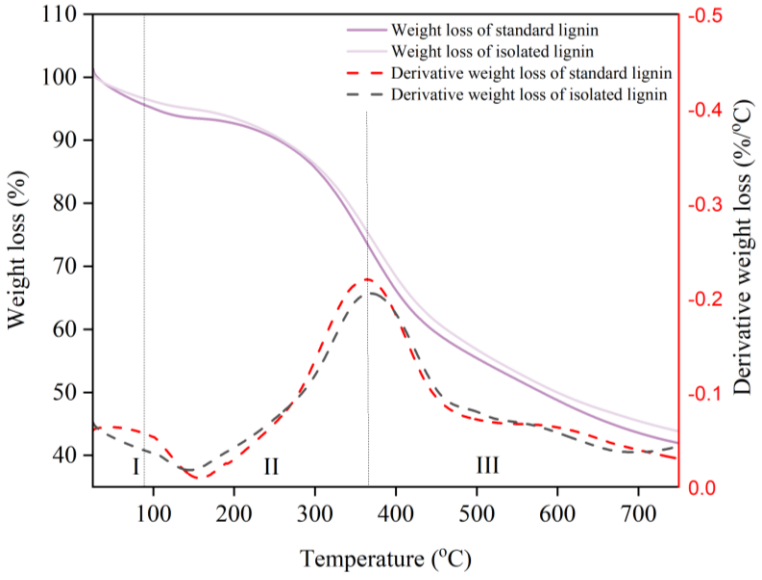


Figure S1. Thermal stability analysis of isolated lignin and standard lignin using TGA and DTG

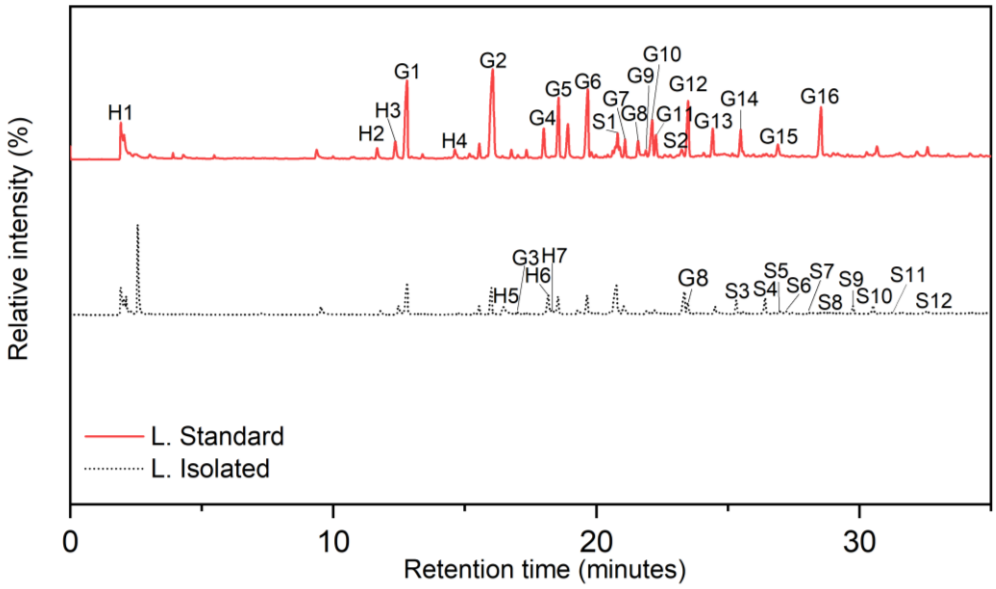


Figure S2. Py-GCMS chromatogram of l-isolated and l-standard.

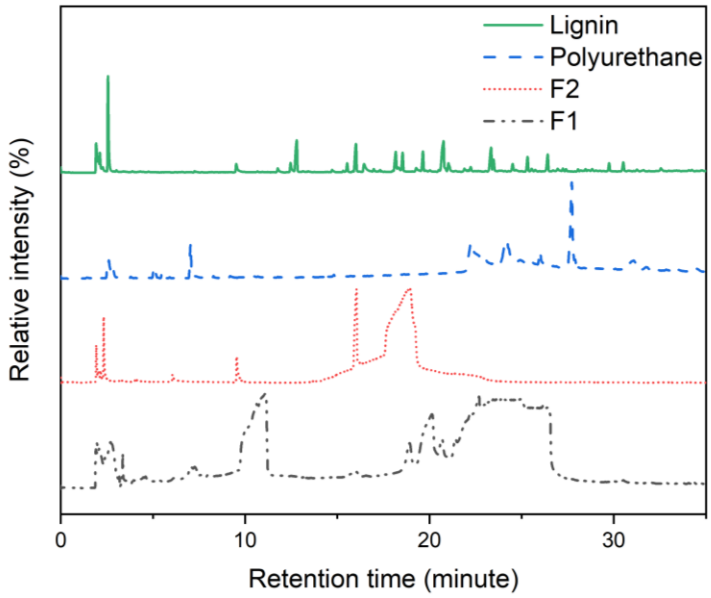


Figure S3. Py-GCMS chromatogram of lignin Bio-NIPU.

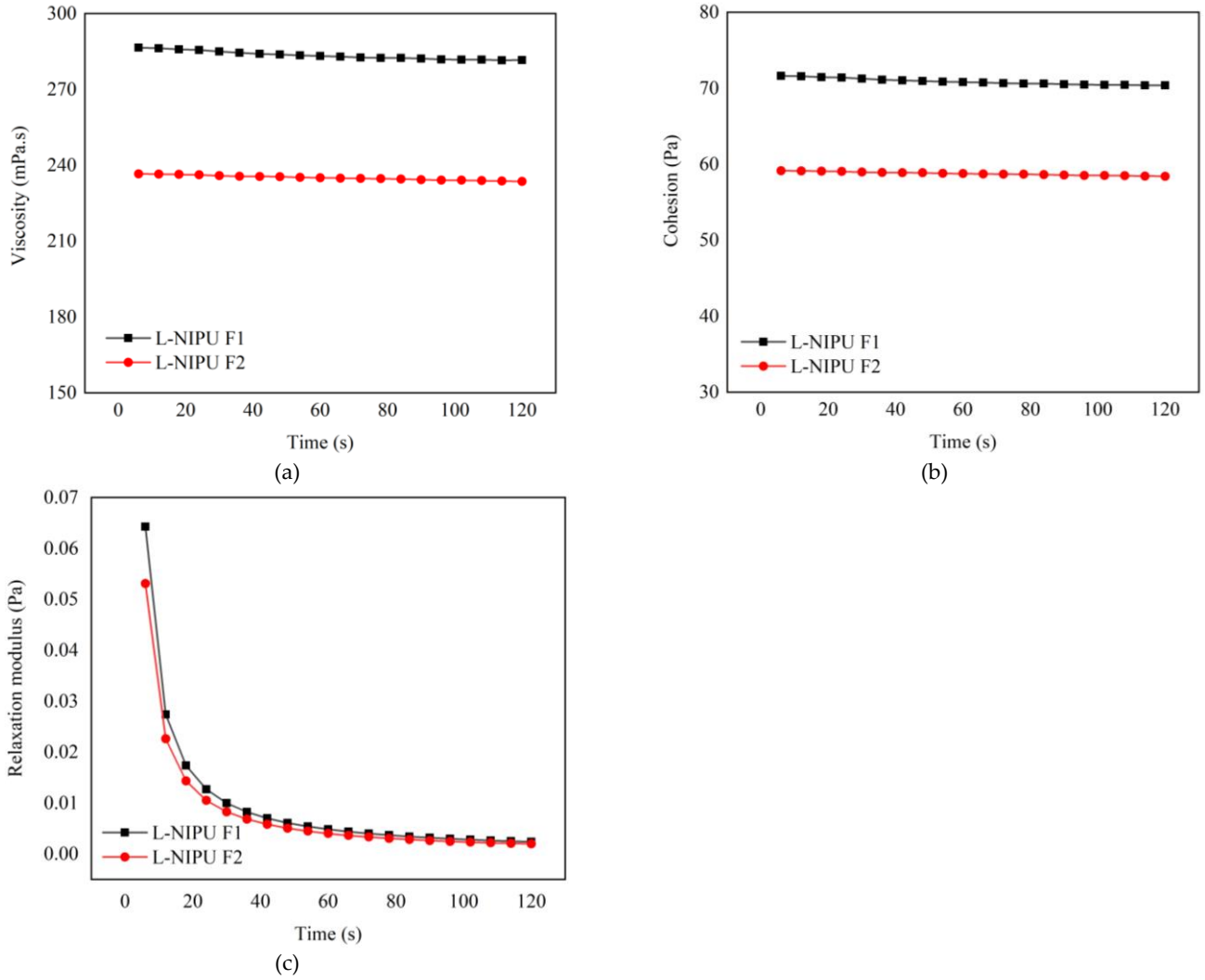


Figure S4. (a) Viscosity; (b) Cohesion; and (c) Relaxation modulus of lignin Bio-NIPU.

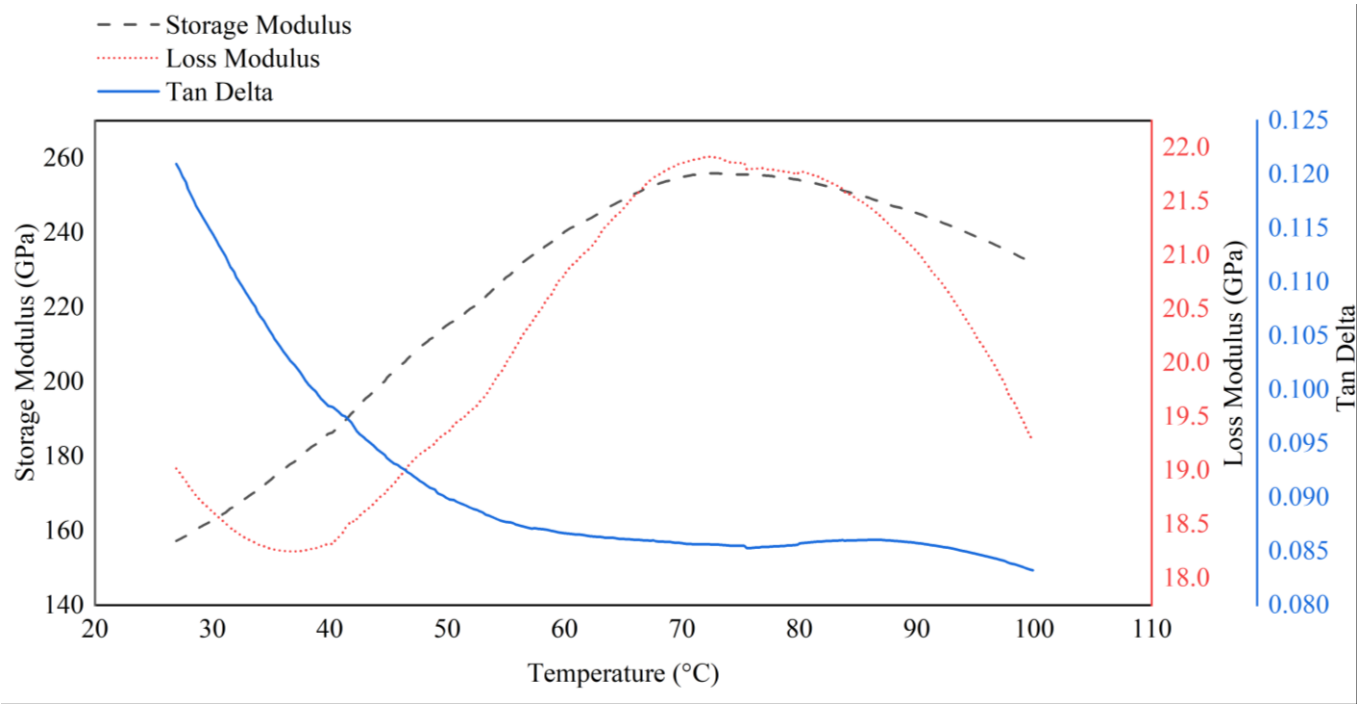


Figure S5. Thermo-mechanical analysis of lignin L-NIPU.

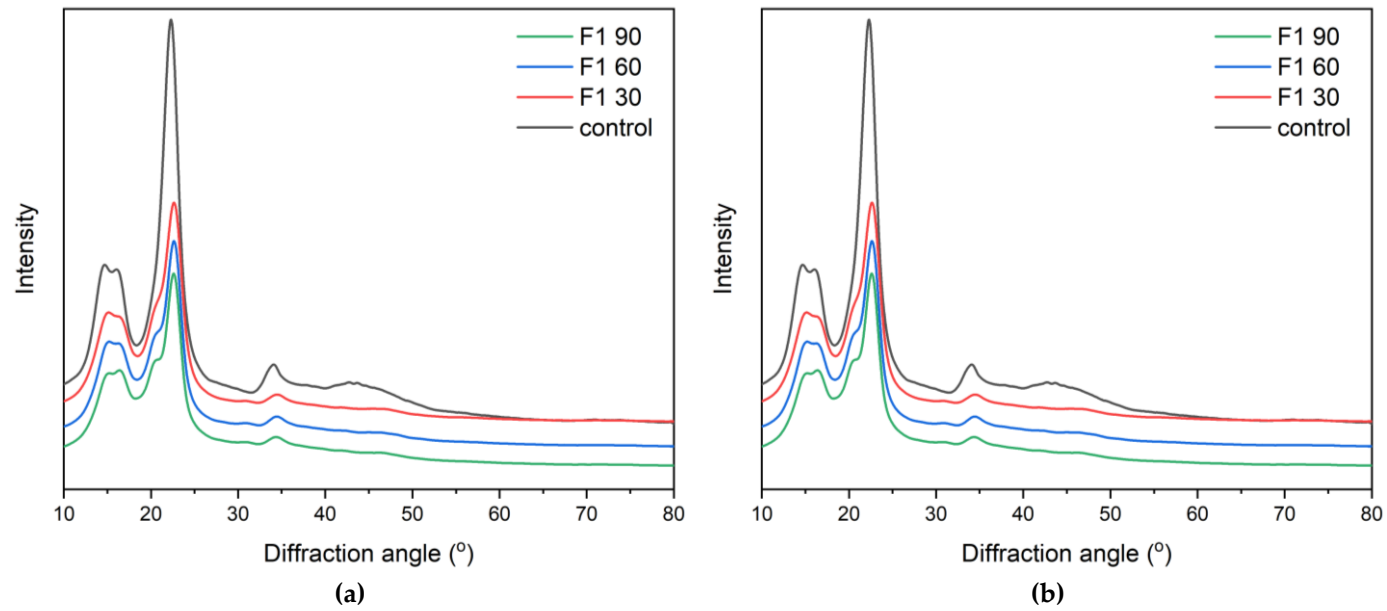
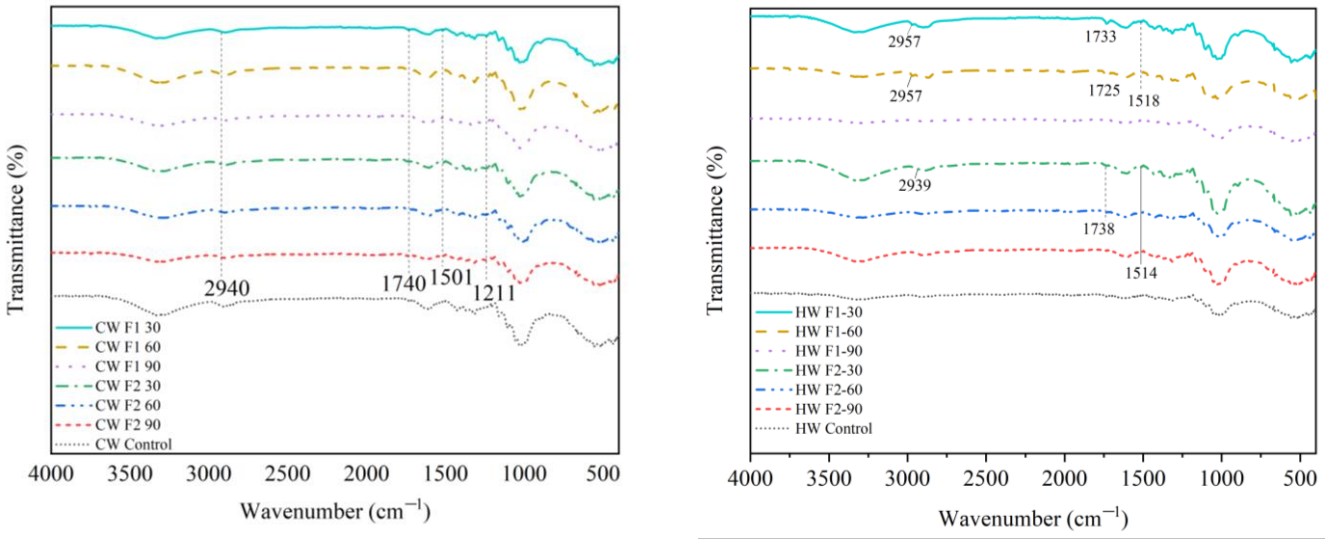


Figure S6. Crystallinity analysis by ramie fiber using XRD (a) Ramie impregnated with F1 lignin-based Bio-NIPU, and (b) Ramie impregnated with F2 lignin-based Bio-NIPU.



(a) **(b)**

Figure S7. Changes in functional groups of imprenated ramie fiber treated by hydrolysis using (a) cold water and (b) ater 60℃.