

Supplementary Materials

# A Branched Polyelectrolyte Complex Enables Efficient Flame Retardant and Excellent Robustness for Wood/Polymer Composites

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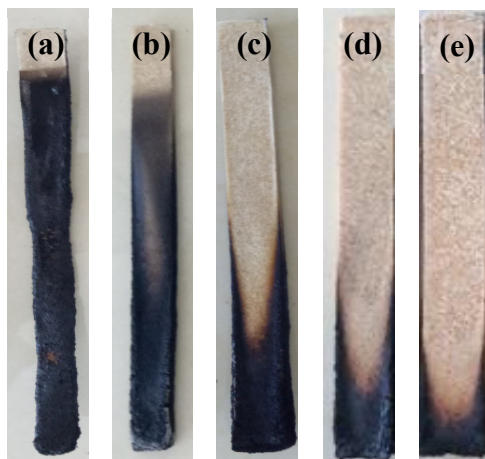
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**Table S1.** Formulation of WPCs with and APP and PECs (wt%).

Samples	HDPE	Wood fibers	Flame retardants
WPC	70	30	0
WPC/APP 15%	55	30	15
WPC/PEC 15%	55	30	15
WPC/PEC 20%	50	30	20
WPC/PEC 25%	45	30	25



**Figure S1.** Digital photos of (a) WPC, (b) WPC/APP 15%, (c) WPC/PEC 15%, (d) WPC/PEC 20%, and (e) WPC/PEC 25% from vertical burning test (UL-94).

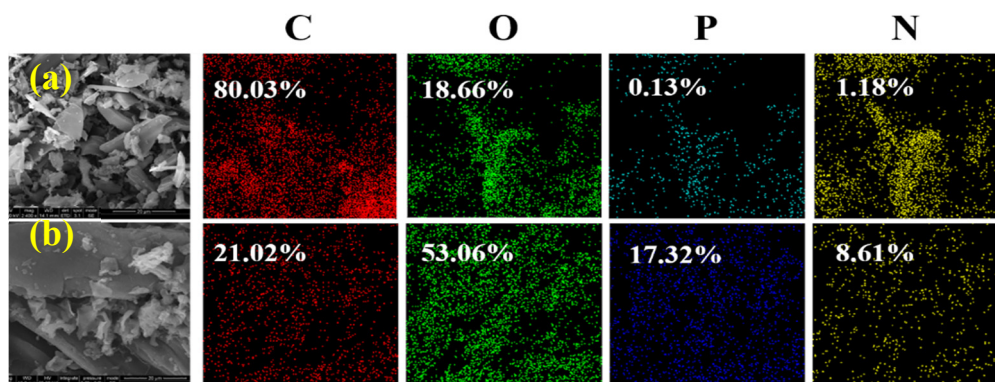


Figure S2. EDX pattern of the char residues from CCT: (a) WPC and (b) WPC/APP 15%. The scale bar of SEM was 10 $\mu$ m.

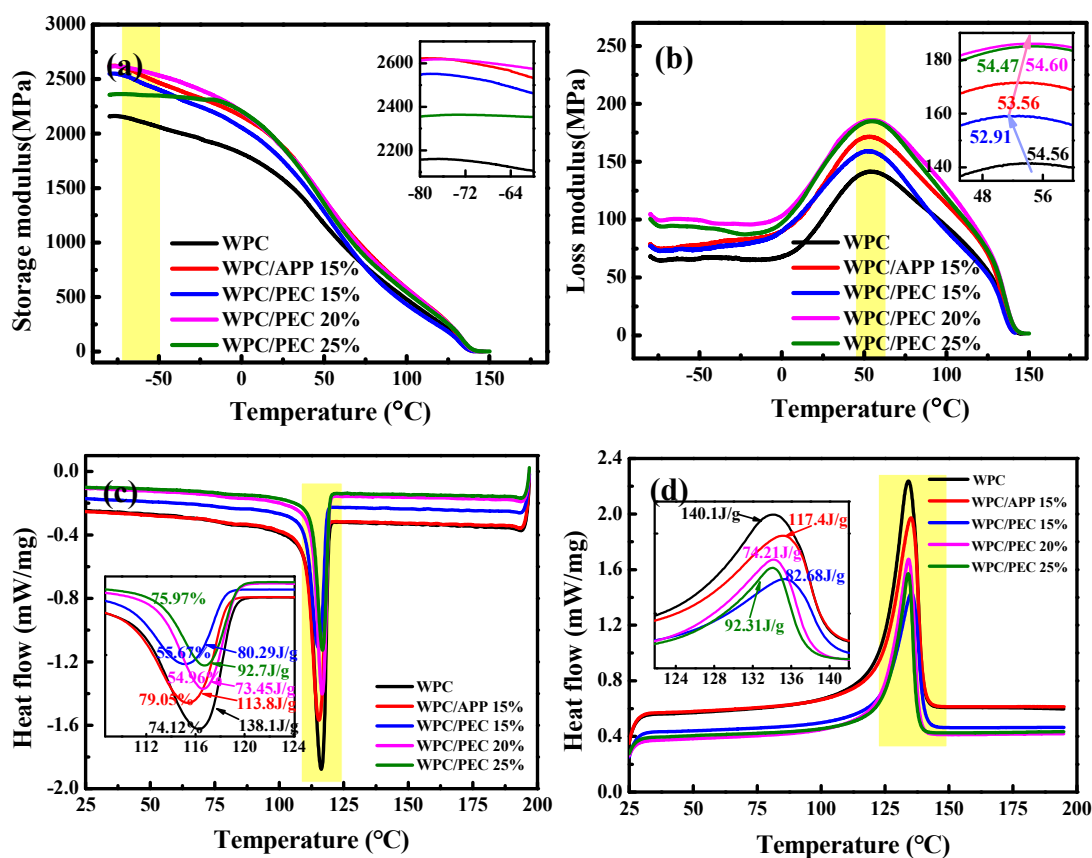
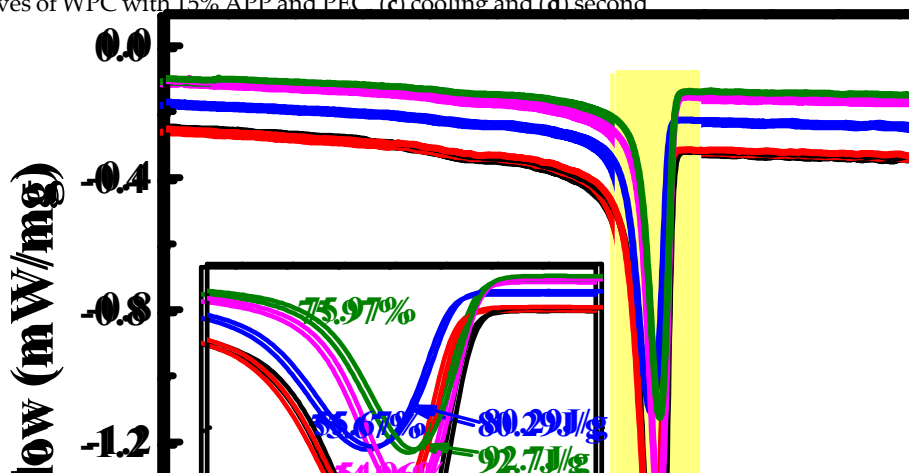


Figure S3. Thermomechanical results: DMA curves of WPC with APP and PEC. (a) storage modulus ( $E'$ ) and (b) loss modulus ( $E''$ ). DSC curves of WPC with 15% APP and PEC. (c) cooling and (d) second heating.



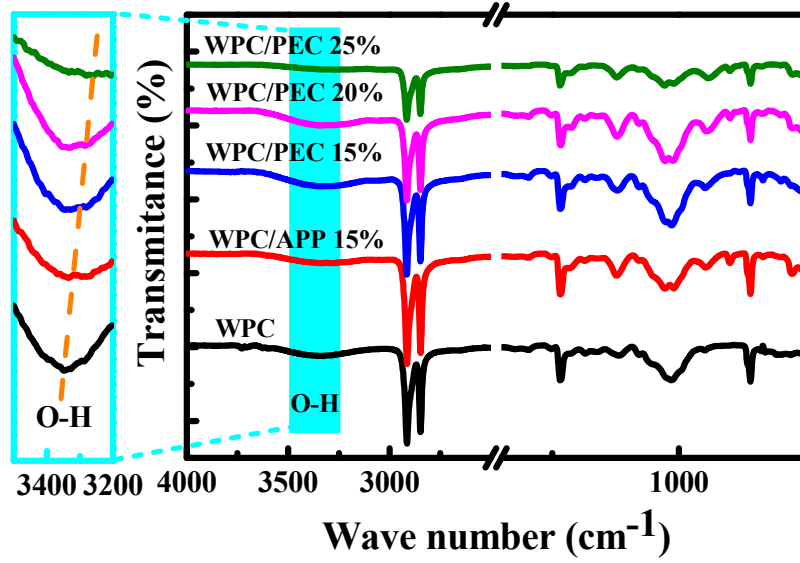


Figure S4. FTIR spectra of WPC/PEC composites.

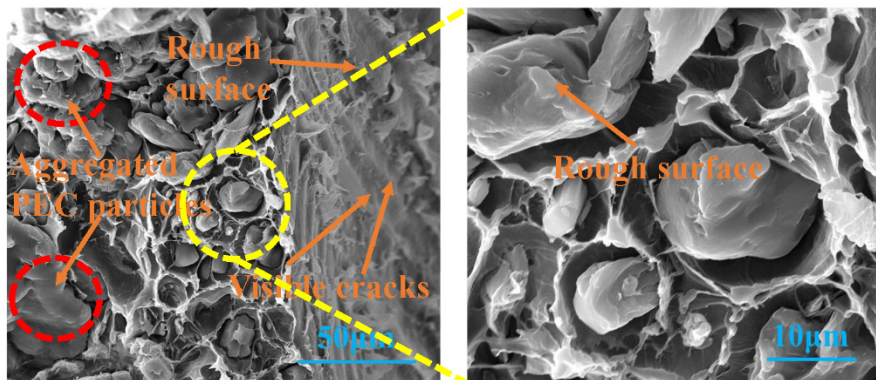


Figure S5. Fractural SEM images of WPC/PEC 20%.



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