Supporting Information

Towards mechanically robust cellulose fiber-reinforced polypropylene composites with strong interfacial interaction through dual modification

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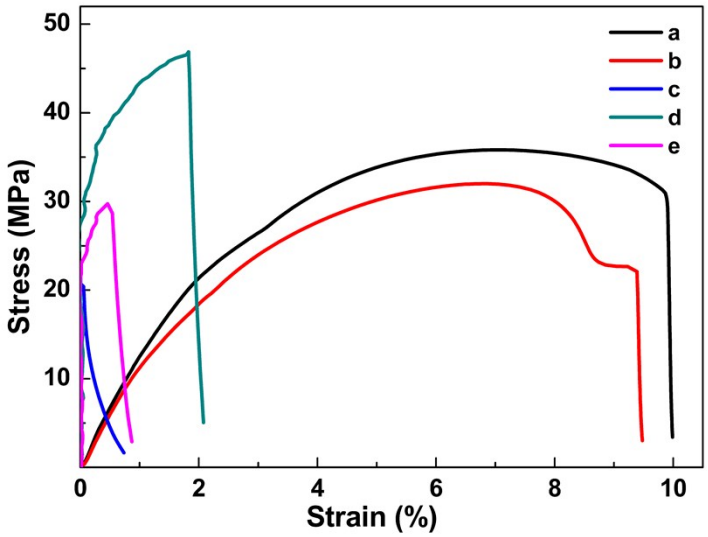

Fig. S1. Comparison of typical stress-strain curves for neat PP (a), modified PP (b), neat PP/TBCF (c), modified PP/TBCF (d) and modified PP/BCF (e) composites with 50 wt% cellulose

Typical stress-strain curves were given in Fig. S1 to investigate the influence of modification on the mechanical properties of composites. The tensile strength of the neat PP is a little higher than that of the modified PP due to the mechanochemical grafting causing some degree of chain scission. Composites reinforced with 50 wt% cellulose fiber shows a higher Young's modulus than neat PP, indicating the reinforcement effect of these fillers. The tensile strength of modified PP/TBCF (50/50 wt%) composites prepared through dual modification was remarkably improved compared to those of neat PP，neat PP/TBCF composites and modified PP/BCF composites, enhanced by about 29.3%, 112.4% and 53.8%, respectively. While the tensile strength of neat PP/TBCF and modified PP/BCF composites dropped below that of neat PP. These results illustrated that the combination of mechanochemical

modification of PP and TEMPO-mediated oxidation of BCF showed a synergistic effect on the tensile strength of the prepared composites, particularly at higher fiber loading. In addition, the elongation at break of cellulose fiber-reinforced PP composites is lower than that of the neat PP, which is common for natural fiber-reinforced polymeric composites.