Alkylated alkali lignin for compatibilizing agents of carbon fiber reinforced plastics with polypropylene

Supplementary Information

Alkylated alkali lignin for compatibilizing agents of carbon fiber reinforced plastics with polypropylene

Hiroki Sakai, Kosuke Kuroda, Shiori Muroyama, Takayuki Tsukegi, Ryohei Kakuchi, Kenji Takada, Ayano Hata, Ryosuke Kojima, Tomoki Ogoshi, Masaaki Omichi, Kazuaki Ninomiya, and Kenji Takahashi

Figure S1 shows melting peaks of PP/lignin derivatives measured by differential scanning calorimetry. Concerning the composites of PP and C_4–C_{10} lignins, melting peak was not observed at the melting point of pure PP but was observed at lower temperature. On the other hand, melting peak was observed at the melting point of pure PP concerning the PP/C_{16} lignin, suggesting that a part of PP does not interact to the C_{16} lignin while agglomerates of the C_{16} lignin were not observed in Figure 2.

It is noted that C_4 and C_{16} lignins were additionally subjected to DSC measurement, and there are no peaks between -100 and 200 ºC. Therefore the peaks shown in Figure S1 are surely derived from pure PP and/or the mixtures of PP/lignin derivatives.

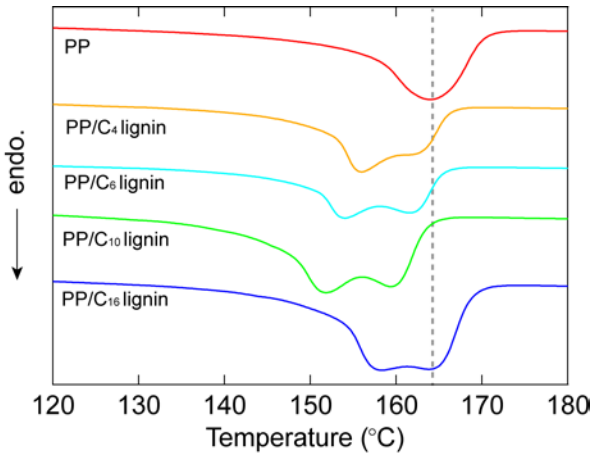

Figure S1 DSC charts of PP/lignin derivatives.

Figure S2 shows the spectrum of the surface of the CF we used, measured by X-ray photoelectron spectroscopy (XPS). The C1s spectra fitted to peaks of three components. The peak at 284.8 eV corresponds to C-C and/or C-H groups. The peak at 286.1 eV corresponds to C-OH group, and the peak at 288.4 eV corresponds to C=O group. From three peaks area ratio, atomic ratio of C-C, C-OH, and C=O were 88 %, 7.3 %, and 4.7 %, respectively. It indicates hydroxyl group and carbonyl group were determined on the surface of the CF.

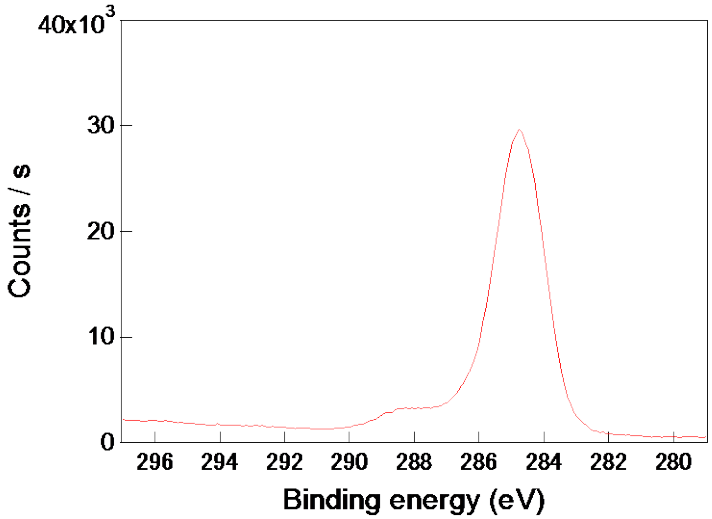

Figure S2 C1s spectrum of surface of CF we used in this study, measured by XPS.