

Butylated lignin as a compatibilizing agent for polypropylene-based carbon fiber-reinforced plastics

メタデータ	言語: eng 出版者: 公開日: 2019-11-15 キーワード (Ja): キーワード (En): 作成者: メールアドレス: 所属:
URL	https://doi.org/10.24517/00056101

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Supplementary Information

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Butylation of lignin can be confirmed by ^1H NMR. We have measured ^1H NMR and the spectra of underivatized lignin and C_4 lignin was shown in Figure R1. (It is here noted that only DMSO-soluble part of the underivatized lignin was measured due to its poor solubility.) After derivatization, some peaks appeared in higher magnetic field side (0.5–2.3 ppm) and they are attributed to the protons of the hydrocarbon chain, although they are ambiguous shape due to the ambiguous structure of lignin.

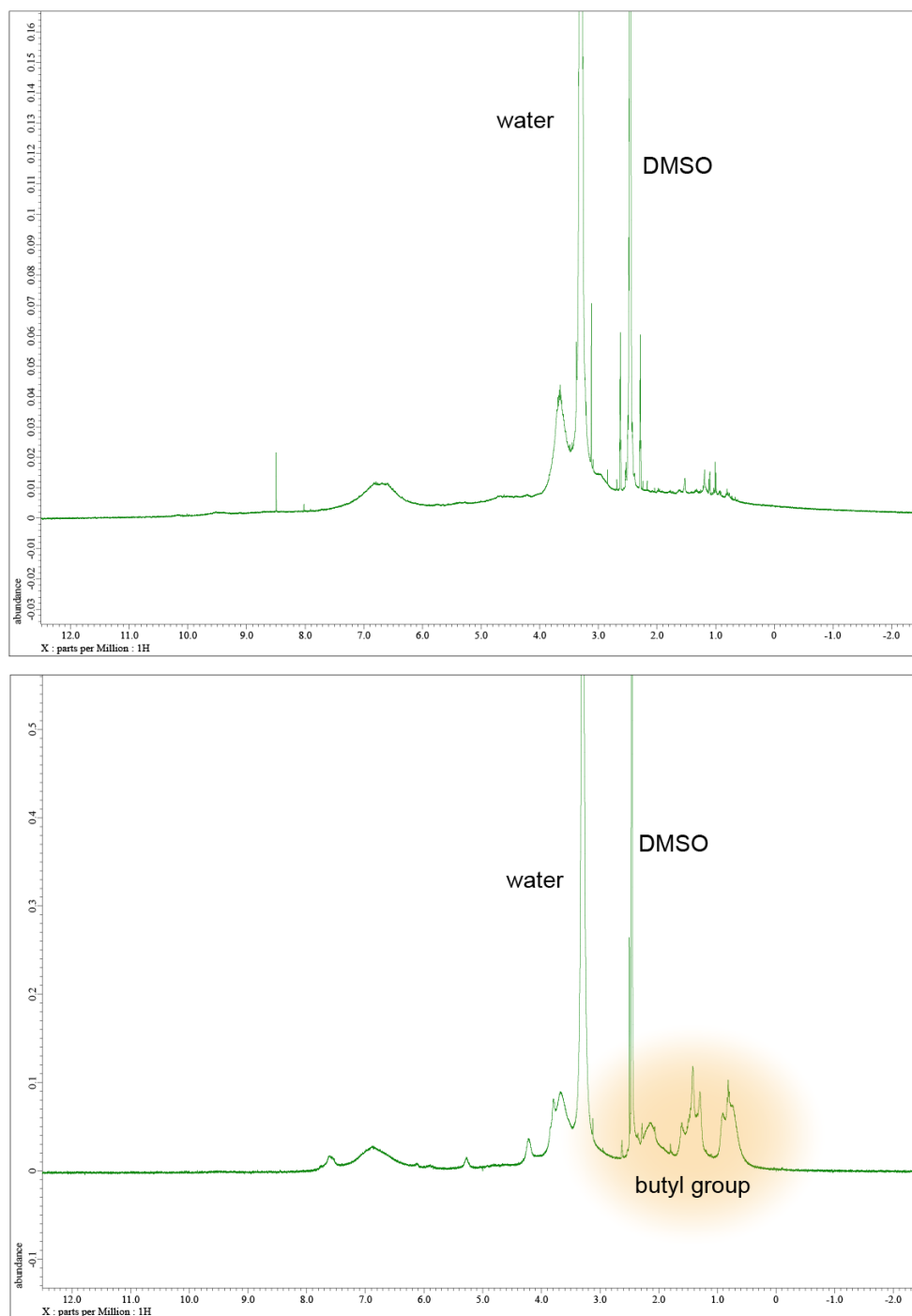


Figure S1 ^1H NMR spectra of (top) underivatized lignin and (bottom) C_4 lignin.

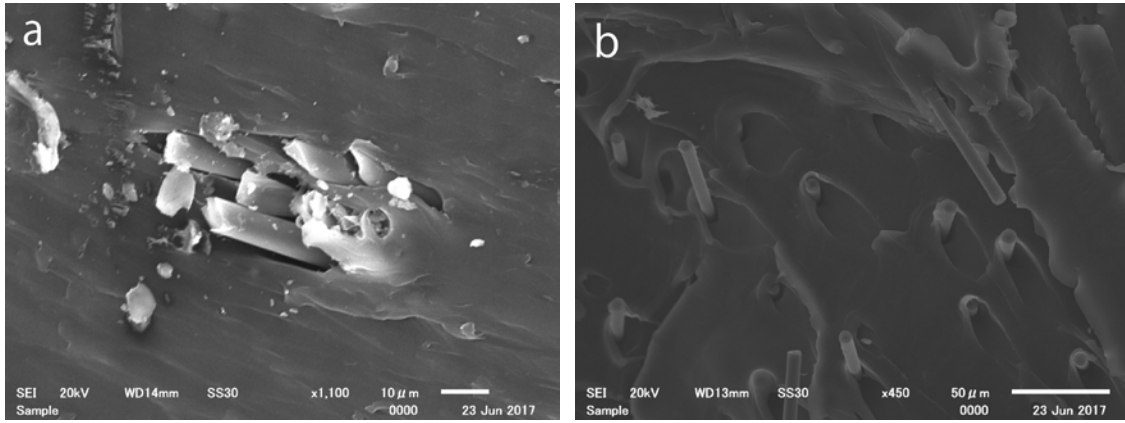


Figure S2 SEM image of (a) PP/CF and (b) PP/CF/C₄ lignin.