

Supplementary Information

Size and Surface Charge Dependent Impregnation of Nanoparticles in Soft- and Hardwood [†]

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[†] In Honor of Professor Bernd Giese on the Occasion of His 80th Birthday.

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Figure S1: FT-IR spectrum of PETES-SiO₂ 70 nm

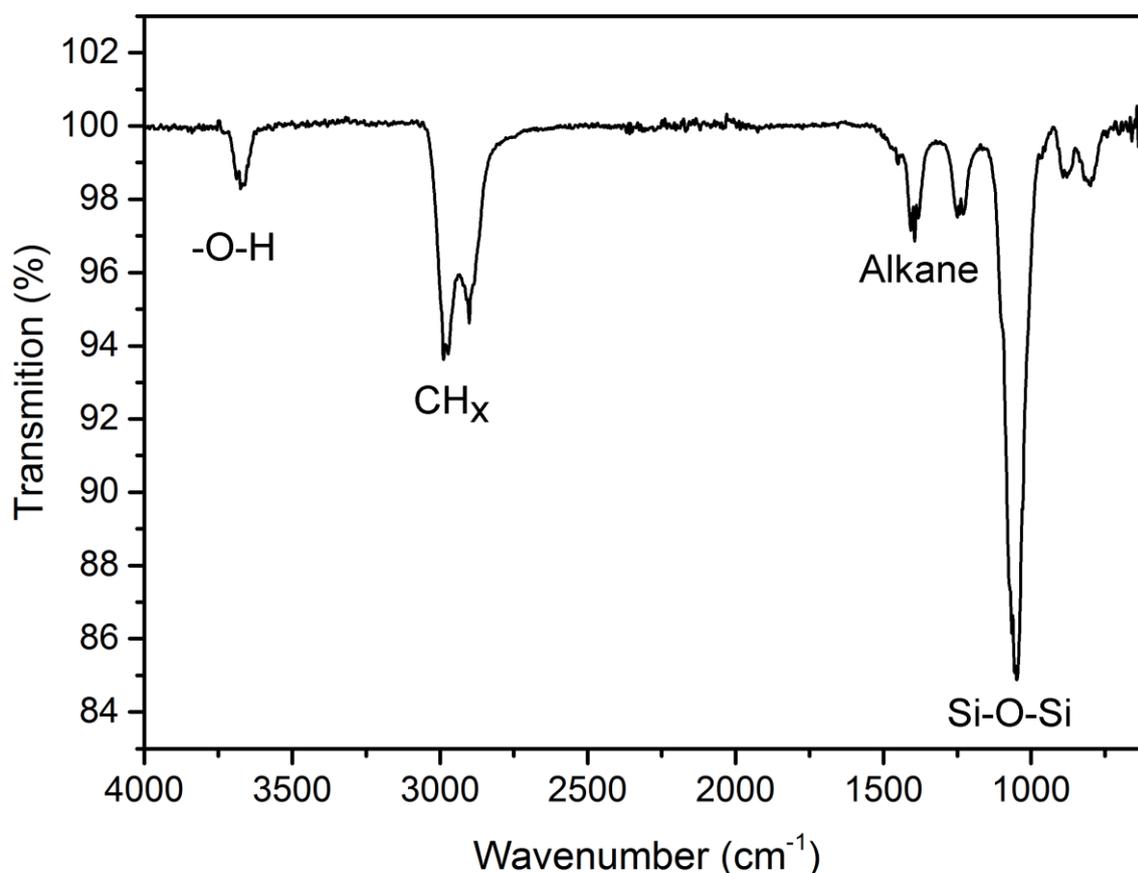


Figure S1. The signal at 3675 cm⁻¹ corresponds to stretching vibration of surface -O-H from remaining unbound silanol groups. The pentyl chain shows characteristic signals from symmetric and asymmetric C-H stretching vibrations at 3000 cm⁻¹. Other C-H signals are attributed to bending vibrations at 1414 and 1230 cm⁻¹ and rocking

vibrations at 892 cm^{-1} , respectively. The intensive signal at 1047 cm^{-1} corresponds to the Si-O-Si stretching vibration.

Figure S2: Impregnation of APTES-SiO₂ 70 nm in EtOH

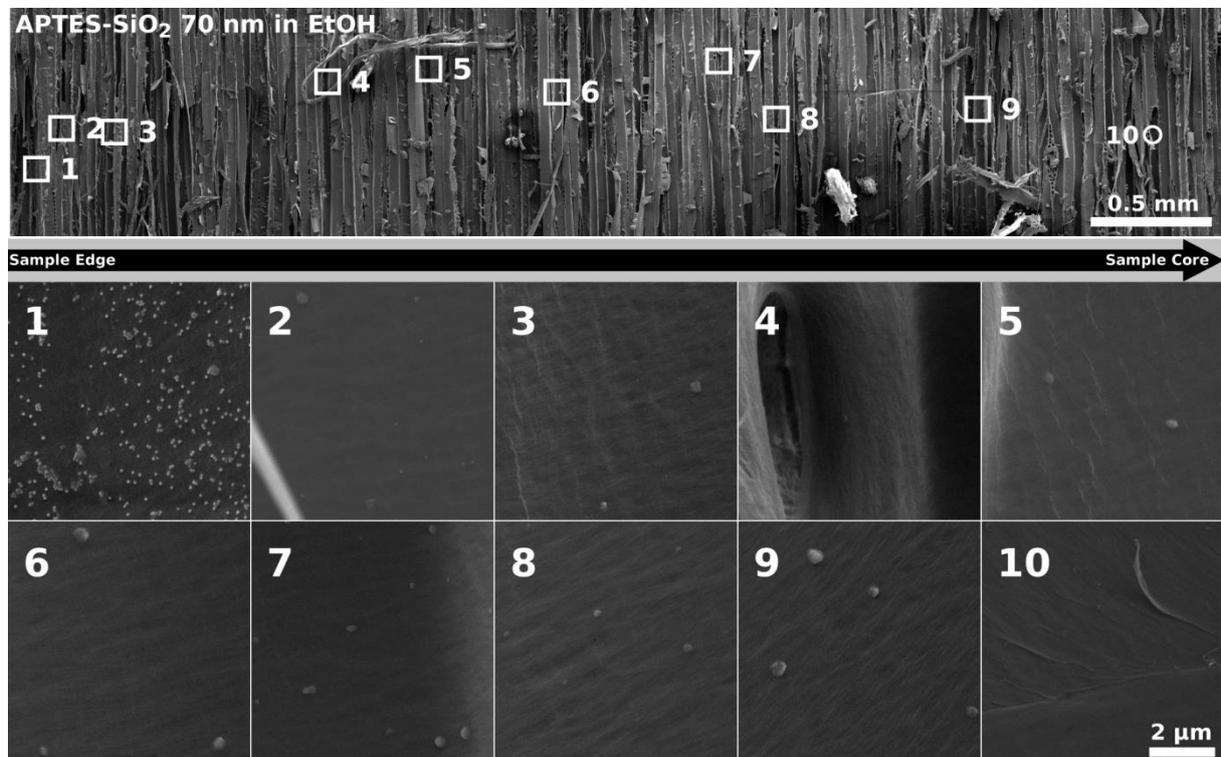


Figure S2. APTES-SiO₂ 70 nm show better impregnation in ethanol than in water. The particles are found in the tracheid closest to the sample edge but not near the core. This could be explained with the improved colloidal stability of APTES-SiO₂ in EtOH compared to water (**Error! Reference source not found.**). The amino propyl functionalization interacts strongly with the wood surface, which has been reported before.^[25]

Figure S3: Impregnation of PETES-SiO₂ 70 nm in EtOH

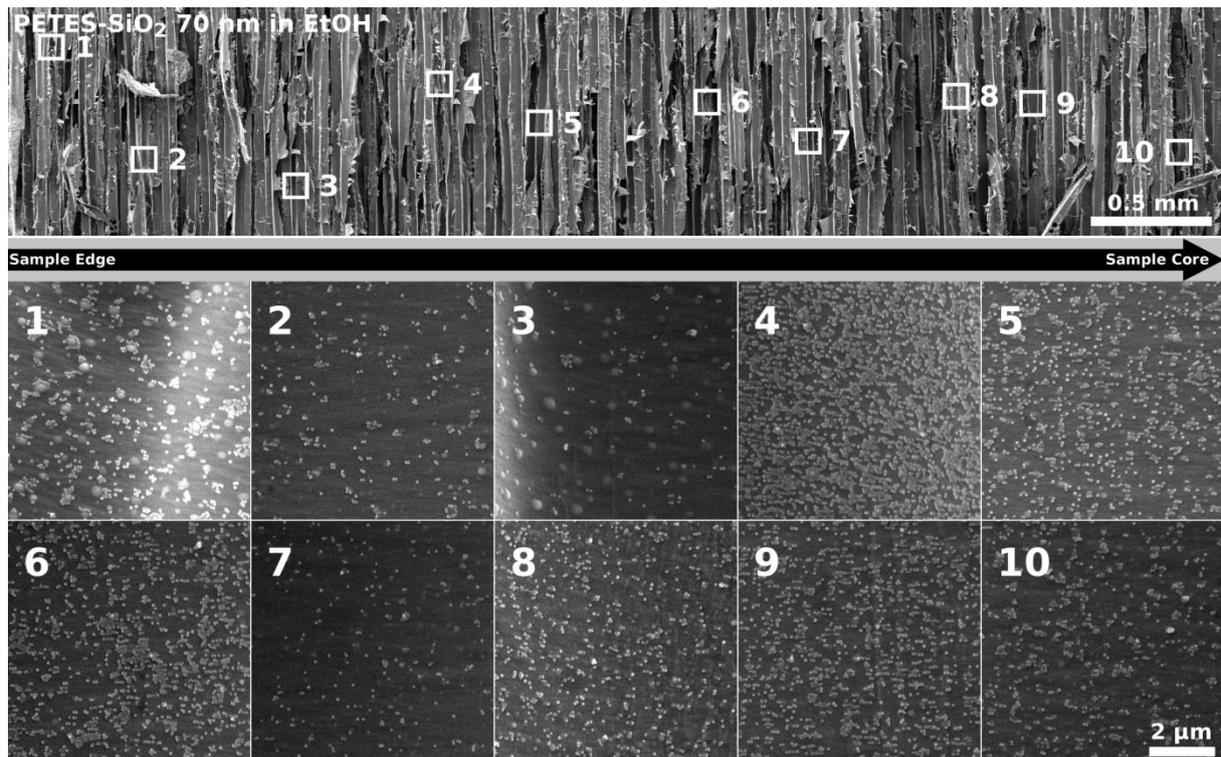


Figure S3. PETES-SiO₂ 70 nm dispersed in EtOH are also detected near the core of pine samples. Fewer particles were found, but again located on the cell wall of tracheids. In general, impregnations in water were better than in ethanol.