

Surface hydrophobization of block-shaped wood with rapid benzylation

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Experimental section

Dynamic mechanical analysis (DMA)

A small test piece ($2 \times 2 \times 2$ mm) cut from the surface of the wood sample was subjected to DMA (TMA SS6100; Hitachi High-Tech Science Corp., Tokyo, Japan). An oscillating compressive load of 150 ± 50 mN (frequency of 0.03 Hz) in the R direction was applied to the test piece, and dry nitrogen gas was purged during the measurement. The measurement was conducted with increasing temperature from 30 °C to 200 °C at a constant temperature rate of 3 °C/min. The results of the heating process in the second cycle was computed.

Figures section

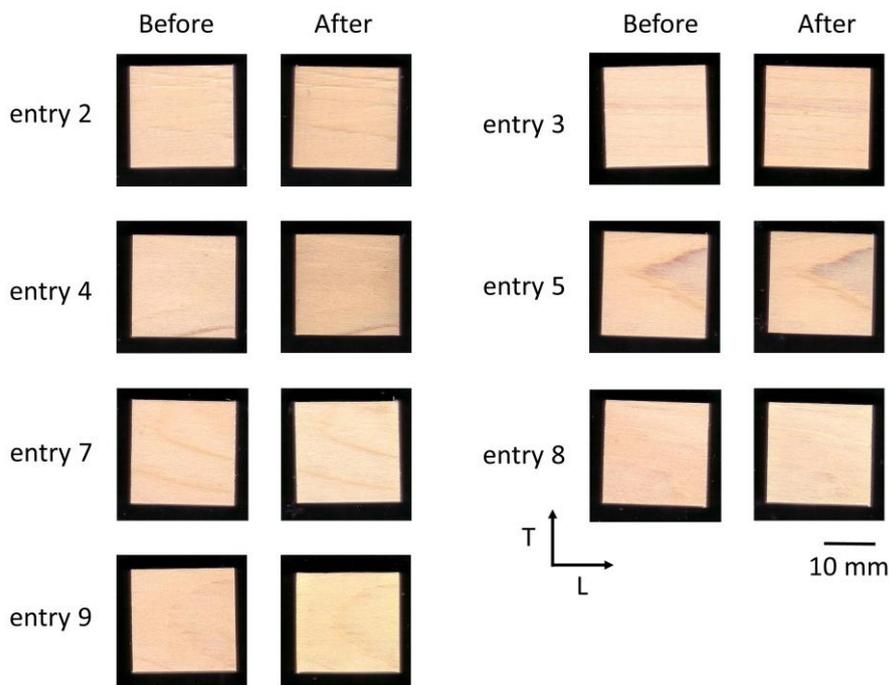


Figure S1. Photographs of block-shaped wood before and after benzylation.

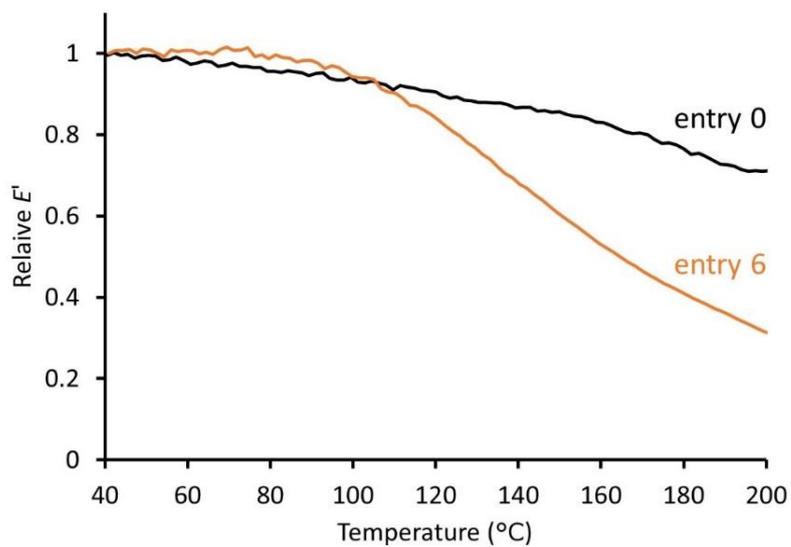


Figure S2. Relative E' of degreased wood (entry 0) and benzylated wood (entry 6) based on E' at 40 °C.

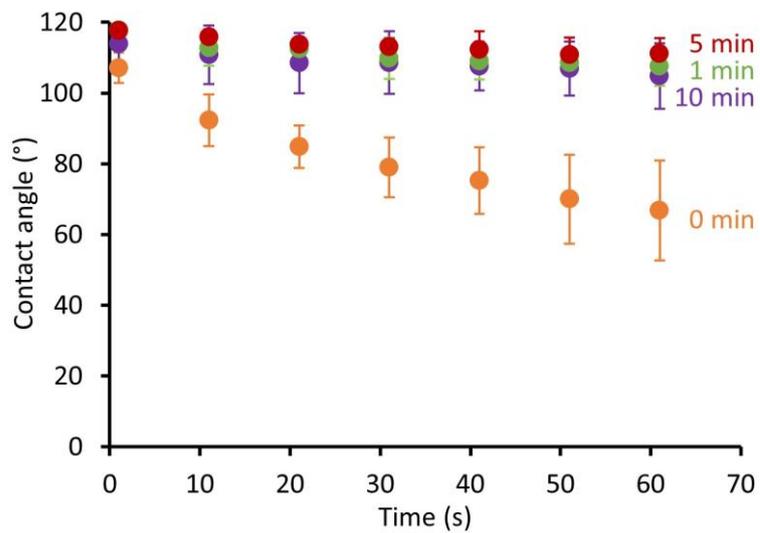


Figure S3. Water contact angle of heat-treated entry 6 surface for 0 (orange), 1 (green), 5 (red), and 10 min (purple). Error bar shows the standard deviations based on the values of 3–5 samples.

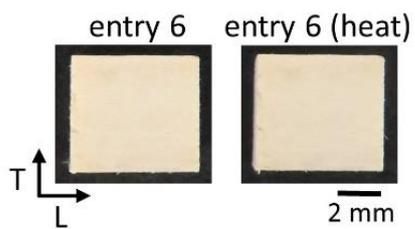


Figure S4. Photographs of a piece of entry 6 before and after heat treatment.

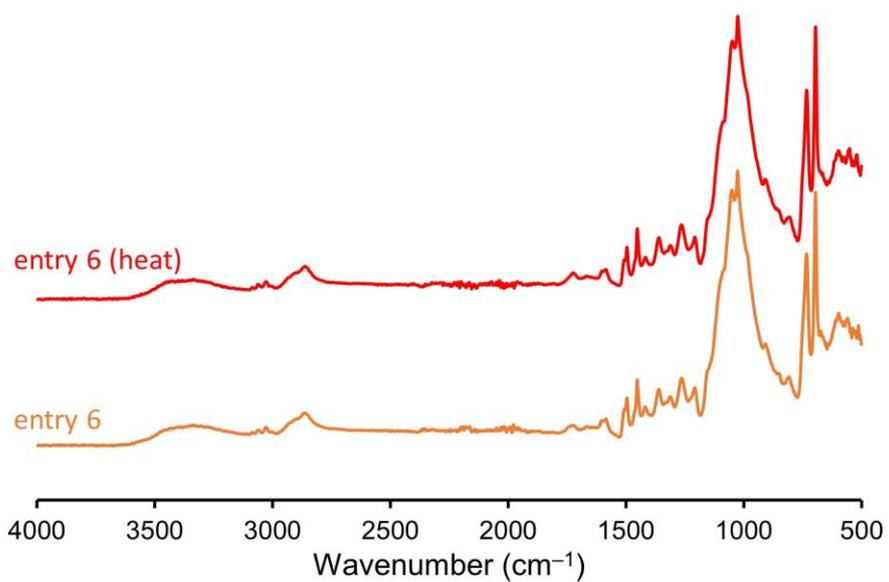


Figure S5. ATR-IR spectra of entry 6 before and after heat treatment.

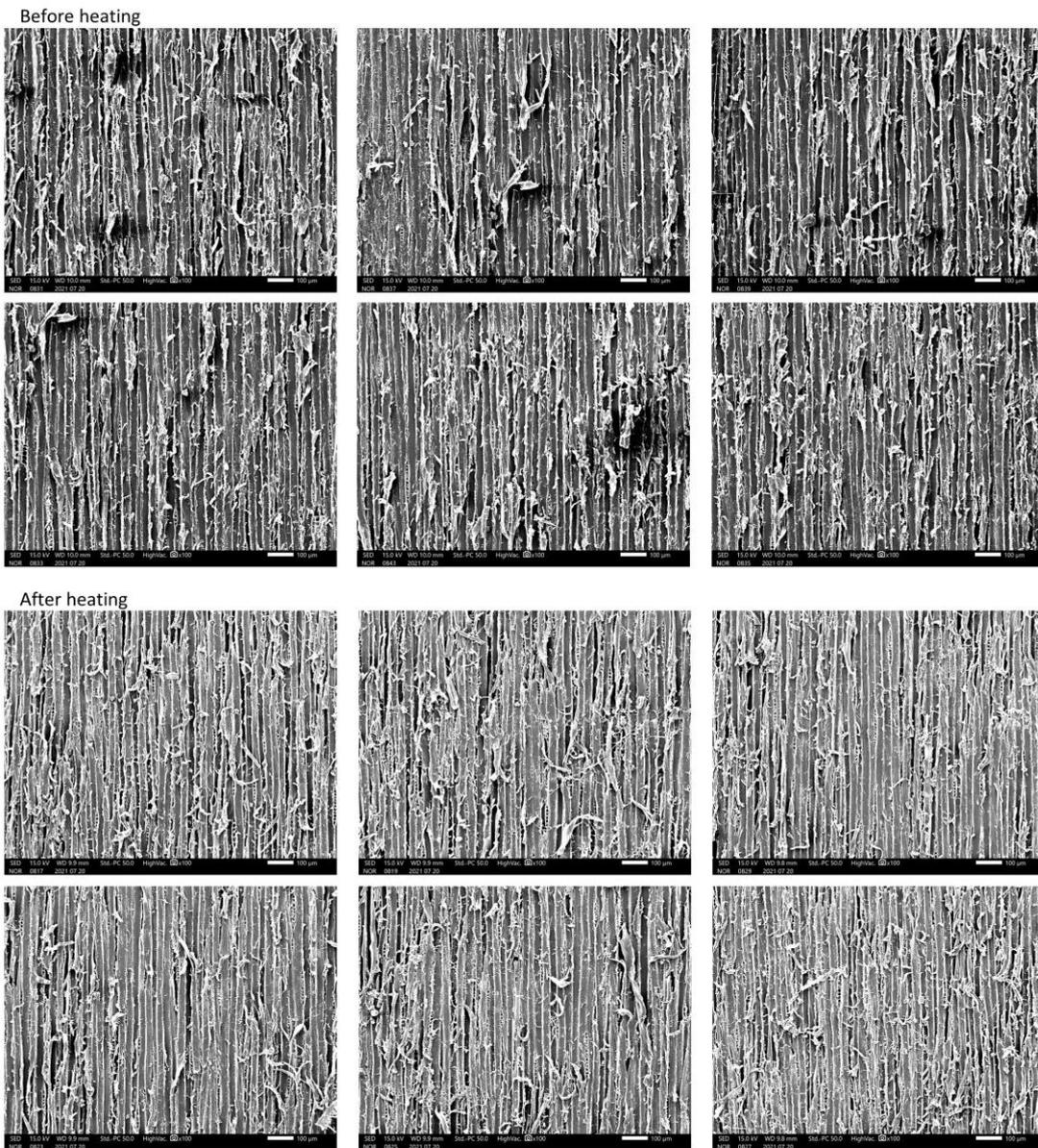


Figure S6. SEM images on various locations in the several samples prepared under the same conditions as entry 6 before and after heat treatment.