

Supporting Information

A simple approach to produce hydrophobic biobased coatings using methylcellulose and organosolv lignin

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Abstract

This document contains the supporting information for the article “A simple approach to produce hydrophobic biobased coatings using methylcellulose and organosolv lignin”. The sections discuss the characterization of lignin, the effect of the number of coating layers on the water contact angle, and the temporal changes in the water contact angle across all samples.

1 Lignin characterization

The ¹H NMR and 2D HSQC NMR spectra of the organosolv lignin used in this study are presented in Figure S1 and Figure S2, respectively.

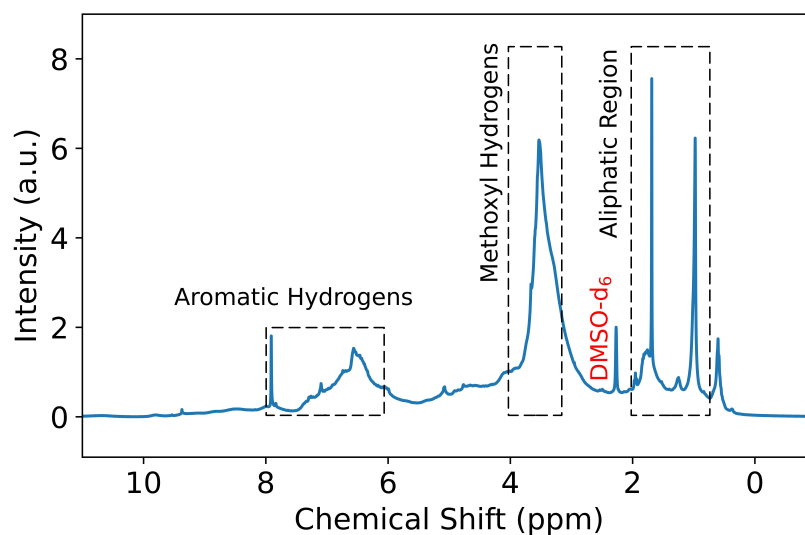


Figure S1: ¹H NMR spectra of organosolv lignin.

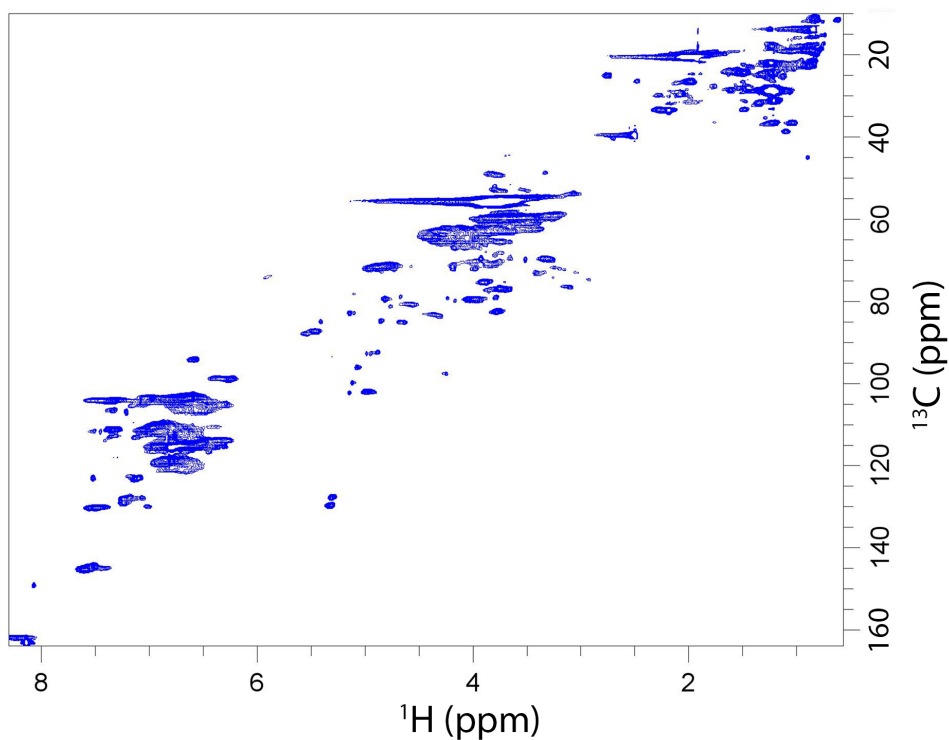


Figure S2: 2D HSQC NMR spectra of organosolv lignin.

The molar mass distribution profile of the organosolv lignin used in this study is shown in Figure S3.

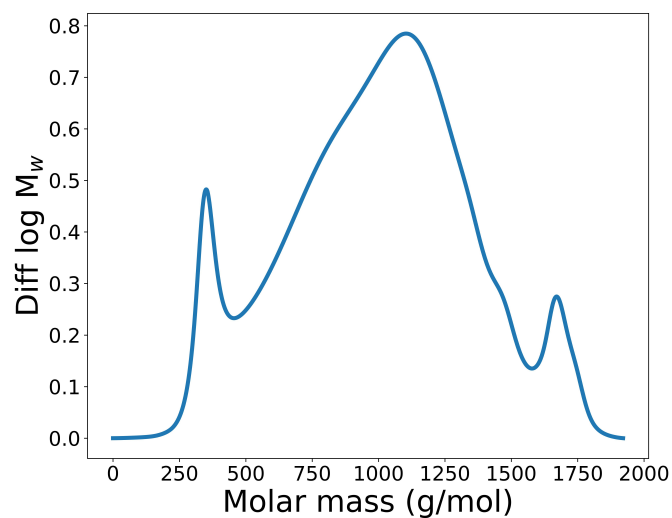


Figure S3: Molar mass distribution profile of the organosolv lignin.

2 Effect of the number of the coating layers

The water contact angle of three glass wafers, coated with one, two, and three layers of a coating suspension comprising 1 wt.% methylcellulose and 1.5 wt.% organosolv lignin, is illustrated in Figure S4 at six different time points.

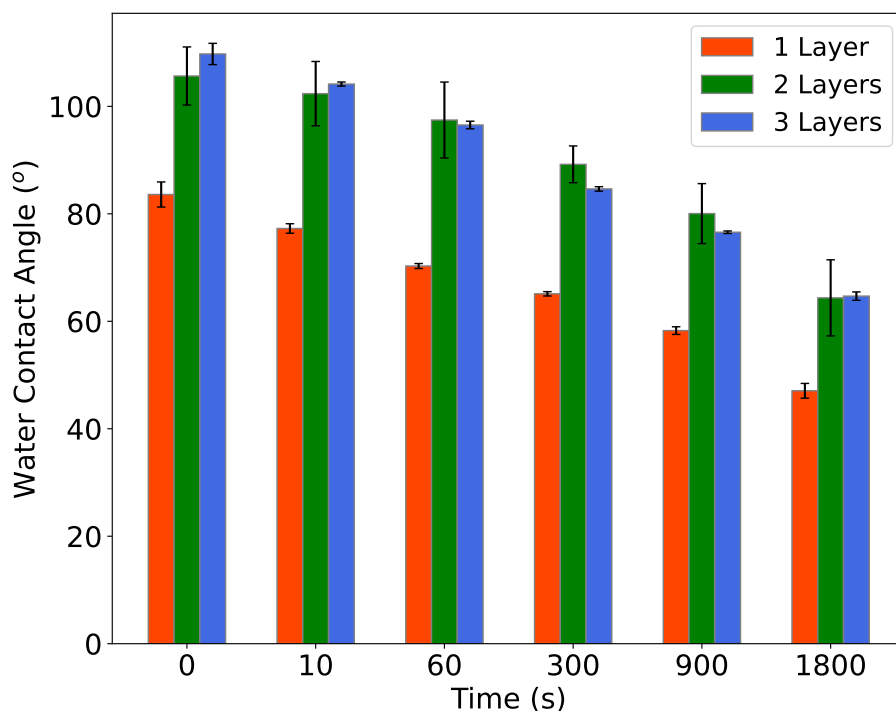


Figure S4: The water contact angle of three samples, coated with a suspension containing 1.5 wt.% lignin and varying in the number of layers, at six different time points.

3 Time evolution of water contact angle

Figure S5 illustrates the evolution of water contact angles for samples coated with suspensions containing lignin concentrations ranging from 0.5 to 4 wt.% over time.

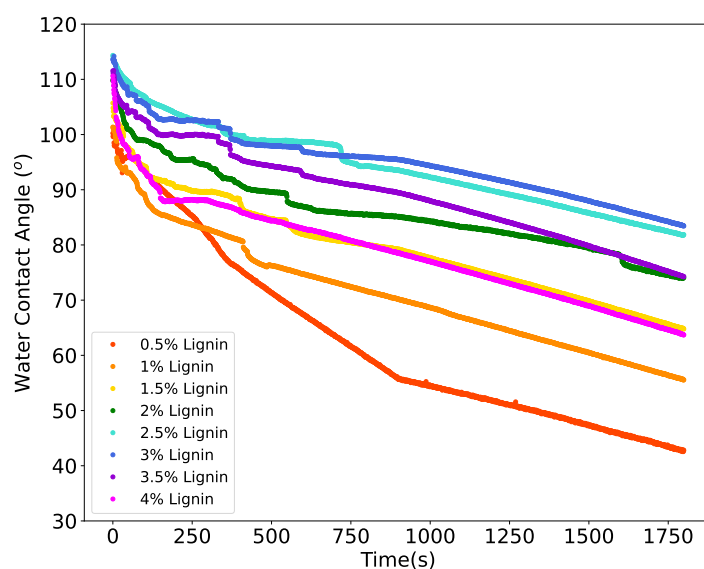


Figure S5: Time evolution of the water contact angle of the samples coated with suspensions containing 0.5 to 4 wt.% lignin.

The main article features a plot displaying the water contact angle evolution over time for four samples, along with numerical model values. Figure S6 presents a similar plot for the other four samples not highlighted in the main article.

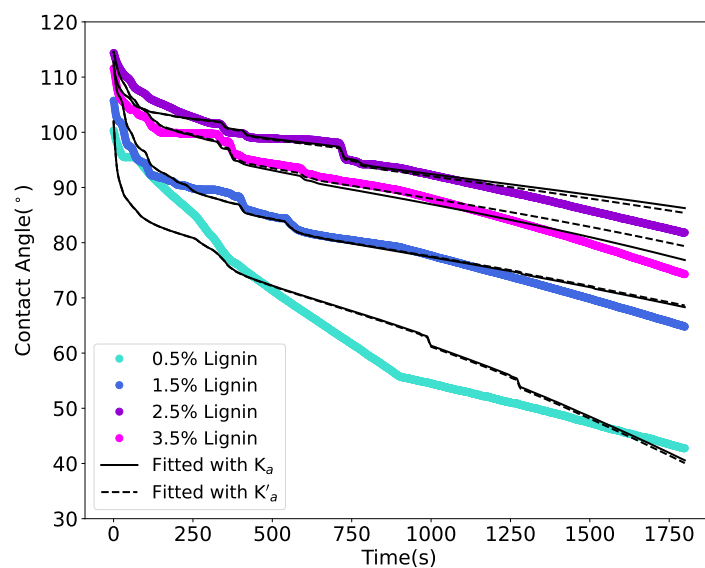


Figure S6: Water contact angle of the samples coated with suspensions containing 0.5, 1.5, 2.5, and 3.5 wt.% lignin. Both experimental and numerical model values are presented.