

Supplementary material

Humidity-dependence of the hydroxyl accessibility in Norway spruce wood

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Table S. 1: Target conditions, measured relative humidity, moisture content and dm/dt during the different steps of the sorption isotherm measurements starting from either never-dried or dried and re-soaked state.

	Target conditions		Starting from never-dried state			Starting from dried and re-soaked state		
	RH (%)	Duration (h)	Measured RH (%)	Moisture content (%)	dm/dt ($\mu\text{g g}^{-1} \text{min}^{-1}$)	Measured RH (%)	Moisture content (%)	dm/dt ($\mu\text{g g}^{-1} \text{min}^{-1}$)
Desorption isotherm	95	60	94.7	29.3	-1.4	94.8	27.4	-1.9
	80	24	81.2	19.34	-2.9	81.2	18.2	-2.6
	65	12	66.1	14.4	-4.7	66.2	13.9	-4.1
	50	12	50.9	10.9	-3.3	50.9	10.6	-3.0
	35	12	35.8	8.0	-2.5	35.8	7.8	-2.6
	20	12	19.5	5.2	-1.9	19.5	5.1	-1.9
	0	24	0.5	0	-1.0	0.5	0	-0.5
Absorption isotherm	20	12	19.3	4.1	0.4	19.4	4.2	0.4
	35	12	35.4	6.3	0.8	35.5	6.3	0.7
	50	12	50.5	8.4	1.1	50.6	8.5	1.1
	65	12	65.8	11.1	1.7	65.8	11.2	1.0
	80	24	80.9	15.4	0.2	81.0	15.2	0.7
	95	60	94.7	24.8	0.8	94.8	24.1	1.9
Scanning isotherm	80	24	81.1	18.2	-1.9	81.2	17.8	-2.1
	65	12	66.2	13.9	-3.3	66.2	13.7	-3.5
	50	12	50.9	10.6	-2.8	51.0	10.5	-2.7
	35	12	35.8	7.9	-2.5	35.8	7.8	-2.4
	20	12	19.5	5.1	-1.5	19.5	5.1	-1.8
	0	24	0.5	0	-0.5	0.5	0	-0.3

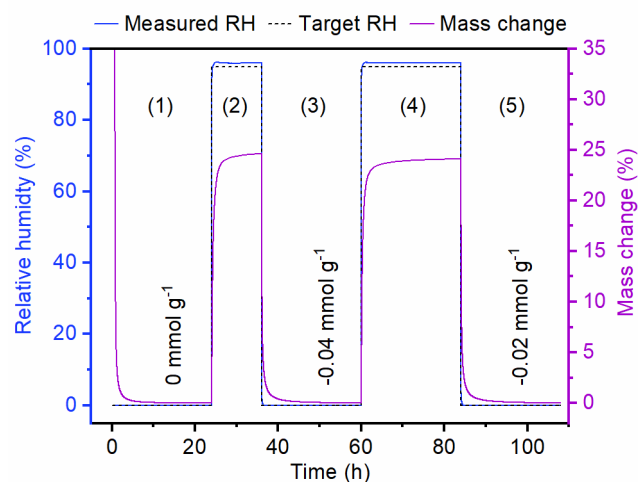


Figure S. 1: Changes in relative humidity and sample mass during a deuteration and re-protonation sequence during which H₂O vapor was used instead of D₂O vapor in step (2). The changes in mass at the end of the drying steps were calculated as remaining OD groups in mmol g⁻¹ using eq. 2 even though they were not caused by deuterium exchange.

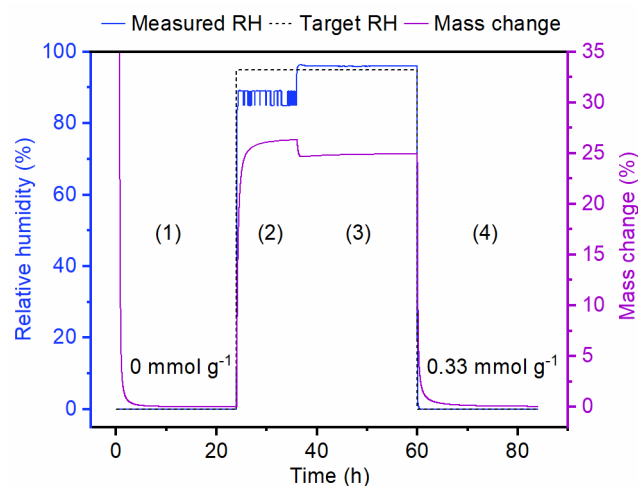


Figure S. 2: Changes in relative humidity and sample mass during a deuteration and re-protonation sequence without intermediate drying step. Deuteration in D₂O vapor occurred in step (2) and re-protonation in H₂O vapor in step (3). The concentrations of remaining OD groups at the end of the drying steps are shown.