Marcon B, Goli G, Matsuo M, Denaud L, Umemura K, Kawai S (2018).
Kinetic analysis of poplar wood properties by thermal modification in conventional oven
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Supplementary Material

Tab. S1 - Settings of the modelling performed in correspondence to Goli et al. (2014). Model improved with the addition of the pre-exponential ratio effect, to determine the master curves and the different kinetics of all studied properties. All the properties are given at the oven-dry state out of the hydric properties.

	Comments	Properties	Master curves: $X_{(t)} =$	X^0	X^1	X^2	τ_1 (h)	τ_2 (h)	p_1	p_2	E_{a1} (kJ.mol^{-1})
Colour	CIE-L*a*b* (D65 light at 10 °)	L^*_{od}	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	39.0	45	/	15	/	0.65	/	118
		a^*_{od}	$X^0 - X^1.\exp((-t/\tau_1)^{p_1}) + X^2.\exp((-t/\tau_2)^{p_2})$	9.20	9.50	5	10	40	0.80	2.00	100
		b^*_{od}	$X^0 - X^1.\exp((-t/\tau_1)^{p_1}) + X^2.\exp((-t/\tau_2)^{p_2})$	16	18	21	10	35	1.20	1.20	100
		ΔE^*_{ab}	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	45	/	12	/	0.70	/	110
Physical	Dimensional changes and mass modification of the samples	$RadRed_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	100	/	5000	/	1.00	/	107
		$TangRed_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	100	/	2500	/	1.00	/	107
		$LongRed_{od}$ (%)	X^0	0	/	/	/	/	/	/	/
		$VolRed_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	100	/	2300	/	0.90	/	107
		$MassLoss_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	100	/	800	/	0.85	/	107
		$DensLoss_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	100	/	1400	/	0.80	/	107
Hydric	Moisture content	EMC_{35} (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	2.6	2.5	/	12	/	0.50	/	135
		EMC_{52} (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	4.3	3.5	/	12	/	0.50	/	135
		EMC_{63} (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	4.8	4.1	/	12	/	0.50	/	135
		EMC_{85} (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	7.2	6.2	/	12	/	0.50	/	135
	Swelling/shrinkage (β^S being constant)	β_R_{0-85} (%/%MC)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0.88	0.57	/	8	/	0.6	/	135
		β_T_{0-85} (%/%MC)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	1.65	1.40	/	8	/	0.7	/	135
		β_L_{0-85} (%/%MC)	X^0	0.25	/	/	/	/	/	/	/
	Sorption curve (GAB model)	w_m	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	2.80	2.50	/	15	/	0.55	/	117
		C	X^0	11	/	/	/	/	/	/	/
		K	X^0	0.74	/	/	/	/	/	/	/

Tab. S1 - (continued).

	Comments	Properties	Master curves: $X_{(t)} =$	X^0	X^1	X^2	τ_1 (h)	τ_2 (h)	p_1	p_2	E_{a1} (kJ.mol^{-1})
Mechanical	Longitudinal (3 points bending)	MOE_L_{od} (MPa)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	8570	/	400	/	1.00	/	113
		MOR_L_{od} (MPa)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	94	/	110	/	0.80	/	100
		$sMOE\_L_{od}$ (GPa.g.cm^{-3})	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	27.60	/	676	/	0.85	/	113
		$sMOR\_L_{od}$ (GPa.g.cm^{-3})	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	0.29	/	145	/	0.67	/	100
		$\varepsilon_{max}\_L_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	149	/	120	/	0.40	/	103
		W_L_{od} (J)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	160	/	20	/	0.50	/	103
	Radial (3 points bending)	MOE_R_{od} (MPa)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	700	/	276	/	0.82	/	113
		MOR_R_{od} (MPa)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	10.80	/	150	/	0.70	/	100
		$sMOE\_R_{od}$ (GPa.g.cm^{-3})	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	2.20	/	314	/	1.34	/	113
		$sMOR\_R_{od}$ (GPa.g.cm^{-3})	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	0.035	/	221	/	0.65	/	100
		$\varepsilon_{max}\_R_{od}$ (%)	$X^0 + X^1.\exp((-t/\tau_1)^{p_1})$	0	2.1	/	300	/	0.60	/	103
		W_R_{od} (J)	$X^0 + X^1.exp((-t/\tau_1)^{p})$	0	6.4	/	35	/	0.80	/	103

Fig. S1 - Effect of the moisture content reduction on the apparent stiffness at normal conditions (65% RH and 20 °C) compared to the oven dry state stiffness (0% MC) based on the identified kinetic model evolutions over heat treatment time at 180 °C related to (a) treatment time in hours and (b) mass loss in percentage.

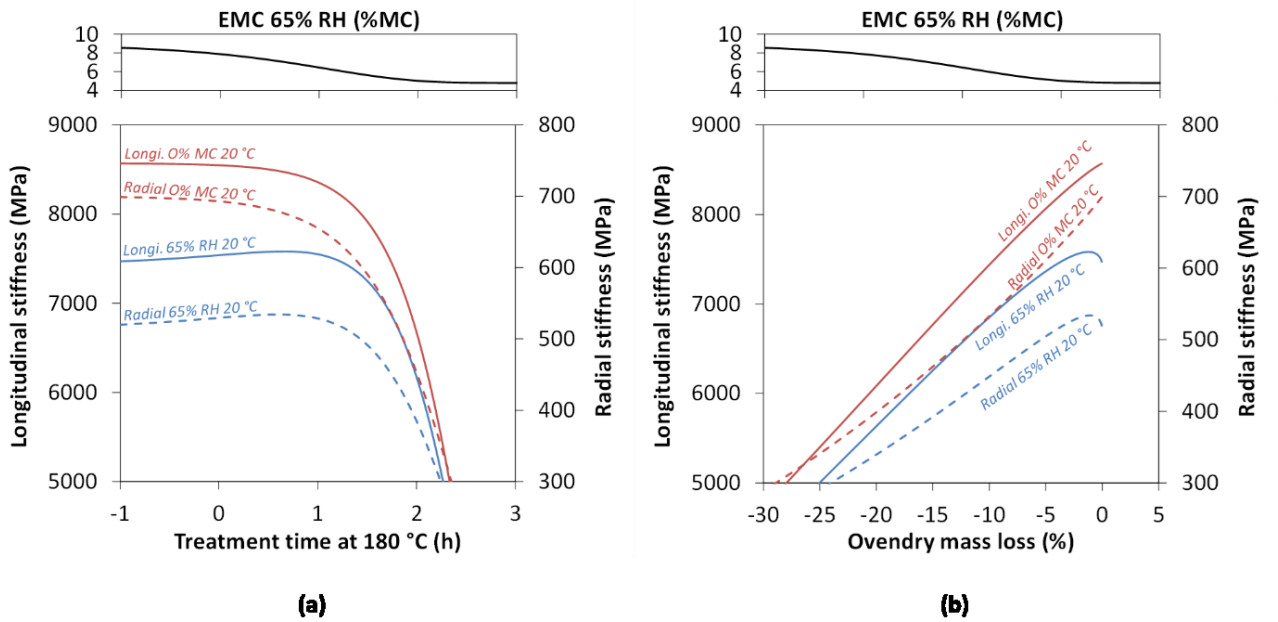

Fig. S2 - Dependencies of the different studied properties to the mass loss.