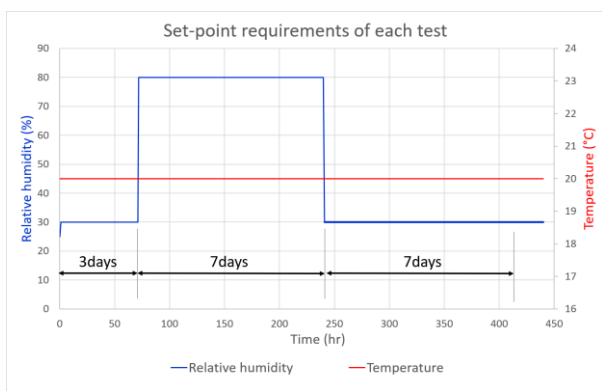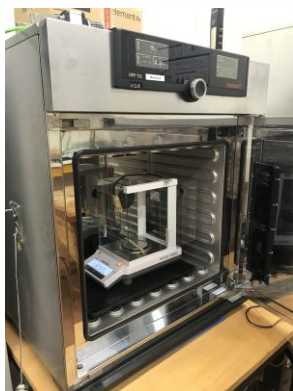GDR Sciences du BOIS,2020, Grenoble

Caractérisation de la cinétique de diffusion hydrique du bois sans défauts de feuillus

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Fig. 1 (a) the setup of instrument (b) the environmental condition

$$EMC(\%) = \frac{1800}{\omega}\left[\frac{Kh}{1 - Kh} + \frac{K_1Kh + 2K_1K_2K^2h^2}{1 + K_1Kh + K_1K_2K^2h^2}\right]$$

Eq. 1

$$\frac{W_{avg\_}W_d}{W_d} = h_{high\ level}$$

Eq. 2

$$rMC(\%) = \frac{W_m - W_d}{W_d} \times 100\%$$

Eq. 3
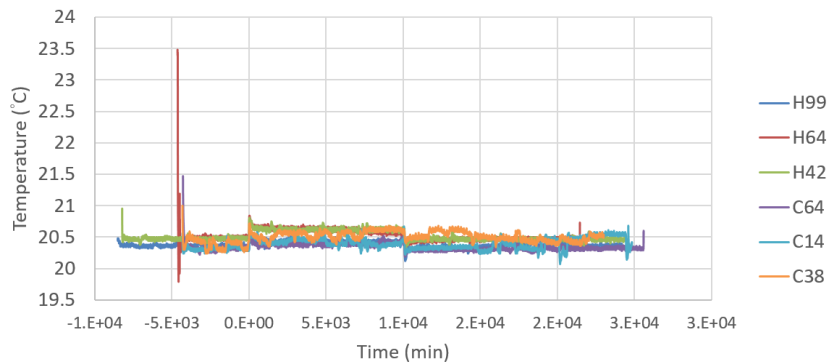

Fig. 2 the record of temperature

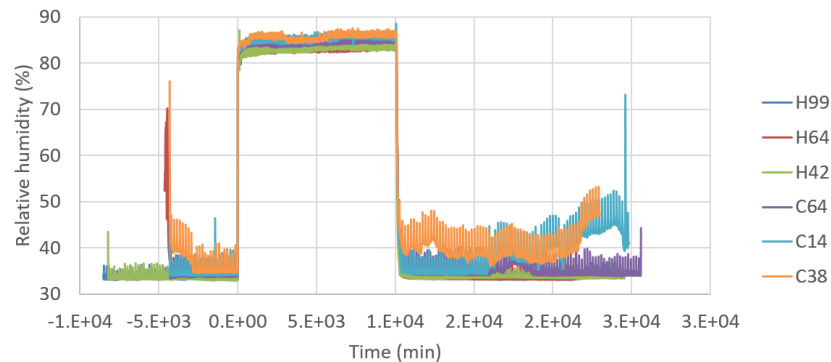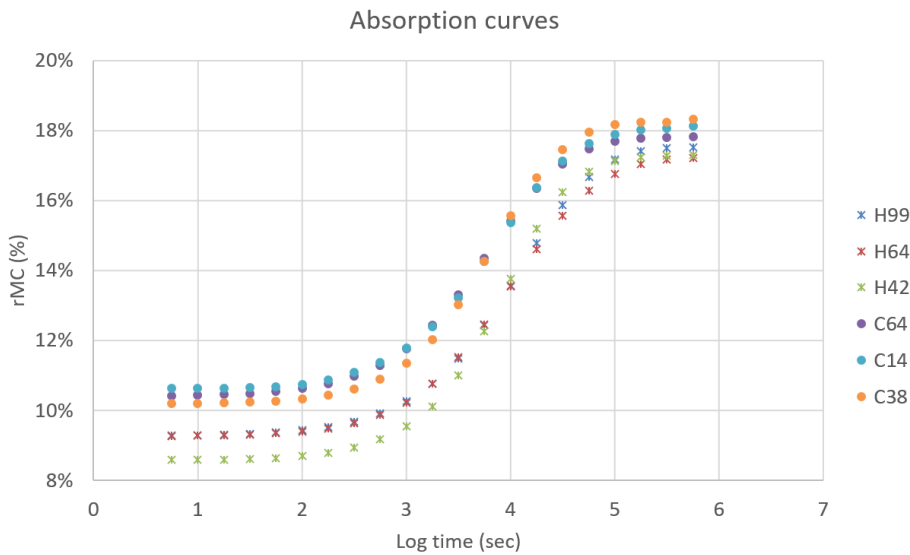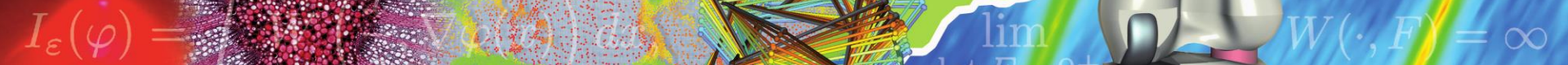Fig. 3 the record of relative humidity
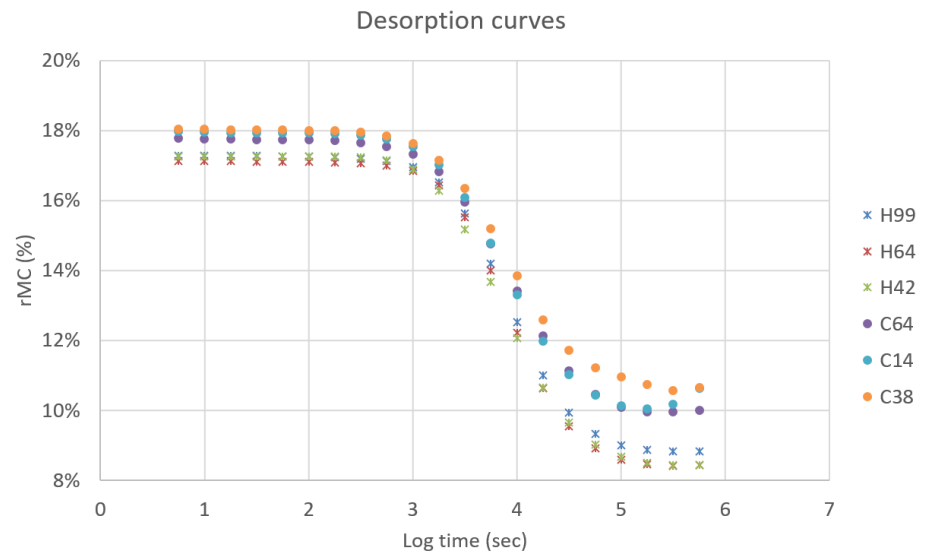
Fig. 4 the results of absorption

Fig. 5 the results of desorption

$$MC(t) = MC_0 + MC_1 \left(1 - e^{\frac{-t}{\tau_1}}\right) + MC_2 \left(1 - e^{\frac{-t}{\tau_2}}\right) \text{Eq. 4}$$

τ: characteristic time
1: Fast sorption
2: Slow sorption

$$MC(t) = MC_0 \pm k \left(1 - e^{\frac{-t}{\tau}}\right) \text{Eq. 5}$$

$$Error = \sum (rMC - MC(t))^2 \text{Eq. 6}$$

Table 1. the parameters of fitting result

	k		τ		Error	
	ab	de	ab	de	ab	de
H99	0.0700	0.0804	10000	10000	0.0006	0.0002
H64	0.0750	0.0857	11851	13089	0.0002	0.0001
H42	0.0848	0.0860	10564	11730	0.0001	0.0001
C64	0.0710	0.0763	7097	12566	0.0002	≈ 0
C14	0.0715	0.0766	8379	11275	0.0001	≈ 0
C38	0.0783	0.0718	8148	12210	0.0001	≈ 0

ab: absorption process; de: desorption process