

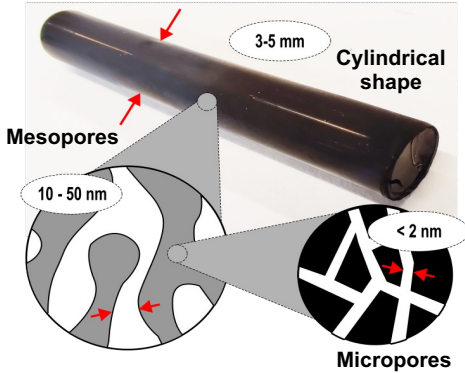
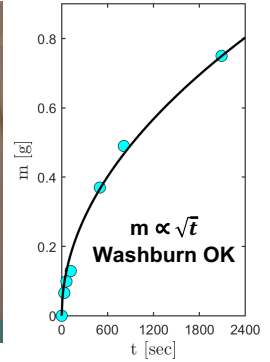
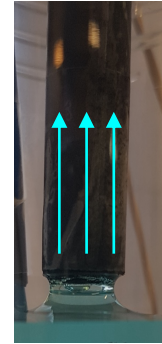
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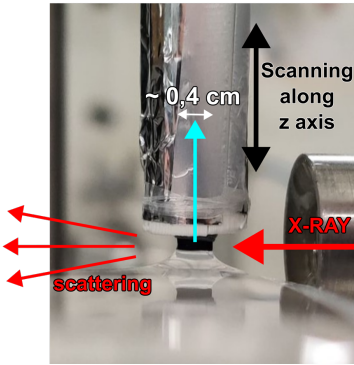
Wetting of micro- and meso-porous carbons

Mass measurements provide data about the volume, but the micropores participate only for 30% at best compared to > 70% for the surface area

How to access to the wetting of micropores?



Time resolved synchrotron measurements

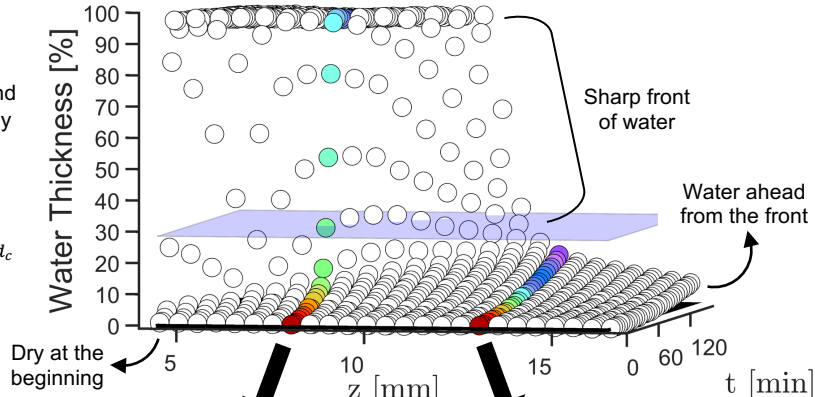


Water is filling from bottom the porous carbon by capillarity and all the setup is vertically moveable.

Beer-Lambert :

$$I = I^0 e^{-\mu_w d_w} e^{-\mu_c d_c}$$

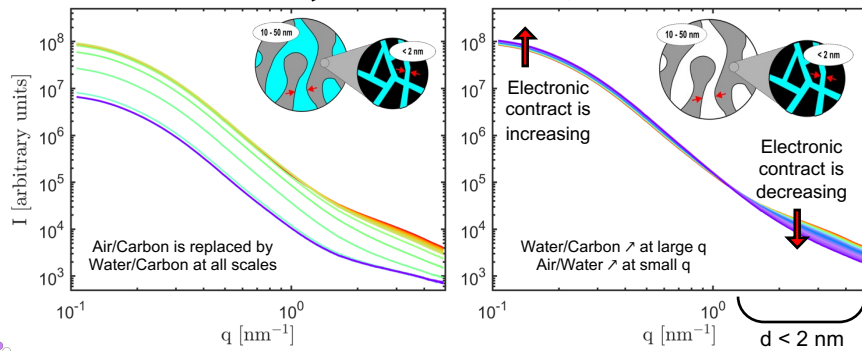
$$\Rightarrow d_w = \frac{-1}{\mu_w} \ln \left(\frac{I}{I_{dry}} \right)$$



Small-angle scattering study

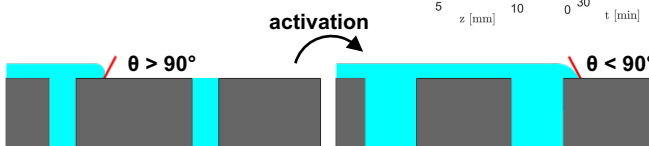
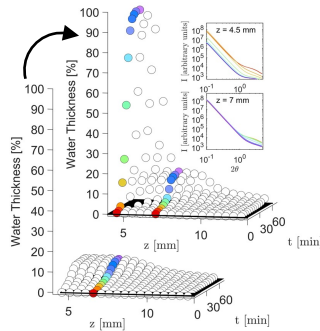
The intensity, related to the electronic contrast (higher for Air/Carbon than for Water/Carbon) is plotted against q , related to the scattering angle and the correlation length.

- The sharp front of water corresponds to a wetting at all scales
- SAXS data definitely show that the water ahead is located in the microporous volume



Nano-scale Cassie-Baxter effect

Even a small change of the microporous volume (+20%) can change the whole characteristic of the carbon from hydrophobic to hydrophilic



Open Question

Can we describe the wetting thanks to the Carbon/Water/Air interfaces?

