

Electronic Supplementary Information  
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**Comprehensive study of the templating effect on the ZnO nanostructure  
formation within porous hard membranes**

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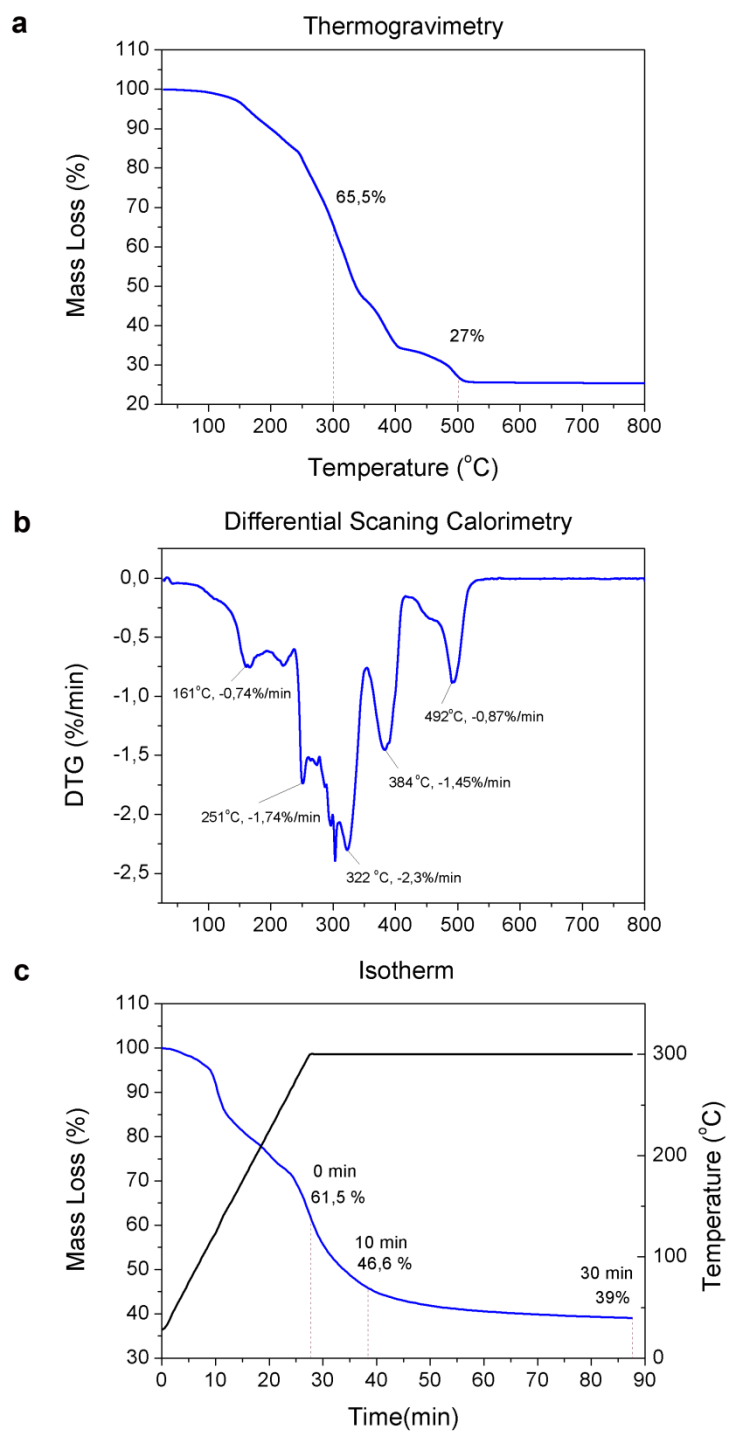
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Thermogravimetry (TGA) analyses were performed with a TG 209 F1 Libra® (NETZSCH GmbH). The precursor solution, composed by Zinc acetate [Zn(AC)] and Diethanolamine used in the sol-gel approach to impregnate the porous templates, was analyzed.

The graphs are reported in Figure S1a and b are the TG analysis and its corresponding first derivative curve (DTG). The measurement was performed in air (20 ml/min) with a heating rate of 5 °C/min.

The TGA curve of Fig S1a shows first a weight loss in the range 150-200 °C, corresponding to the water desorption from the Zn(AC) compound. At 300 °C a rapid weight loss occurs; in particular the series of peaks in the DTG plot (Figure S1b) from 251 to 322 °C could be attributed to a combustion mechanism of organic moieties. The last drop of weight at 492 °C could be related to the char combustion.

In order to simulate template impregnation, isothermal analysis was performed on precursor solution. First the precursor solution [Zn(AC)+DEA] was heated in air (20 ml/min) with a heating rate of 10 °C min<sup>-1</sup> of up to 300 °C and then maintained at this temperature for 60 min (see Figure S1c). This measurement confirms that the greatest part of the weight loss occurs within 10 minutes of maintenance at 300 °C (53.4% wt). It can be also observed an asymptotic behavior after 30 minutes with a maximal weight loss of 61%. This information proves that the combustion step at 300 °C for 10 min is sufficient to remove the major part of organic material, thus keeping free the template channels from organic residues for further impregnations.



**Figure S1.** a) DSC, b) TGA and c) Isotherm plots of the precursor solution (Zn(AC) and DEA) used in the sol-gel approach to impregnate the porous templates. The isotherm was performed with a heating rate of  $10\text{ }^{\circ}\text{C min}^{-1}$  and a dwell time 30 minutes at  $300\text{ }^{\circ}\text{C}$ , simulating the combustion step.