

## **Supporting Information**

### **Mechanical Characterization of Hierarchical Structured Porous Silica by in-situ Dilatometry Measurements during Gas Adsorption**

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6 Pages, 5 Figures, 0 Tables

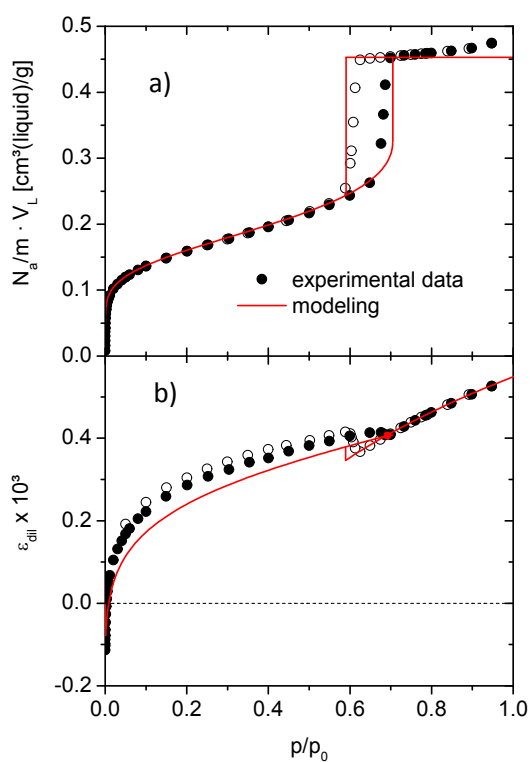


Figure S1:  $N_2$  adsorption isotherm at 77 K (a) and corresponding strain isotherm (b) of the sample *Sint750*. Full symbols denote experimental adsorption, open symbols experimental desorption. The red solid line is the result of the theoretical modeling. The red dot in the theoretical strain isotherm marks the point of capillary condensation.

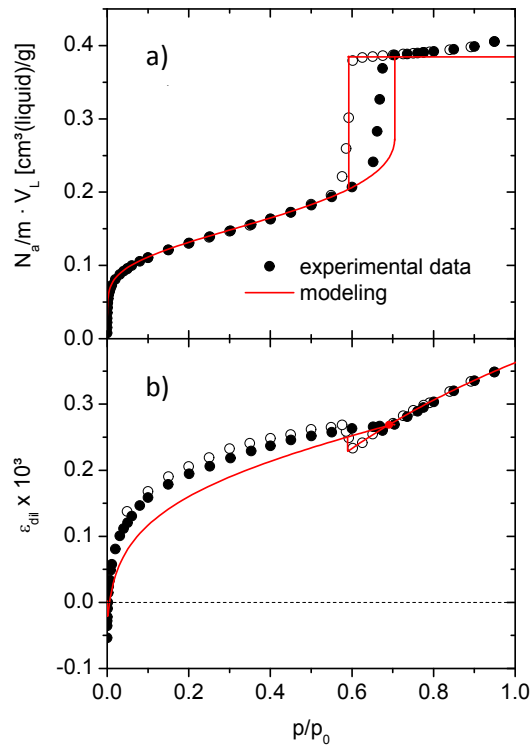


Figure S2:  $N_2$  adsorption isotherm at 77 K (a) and corresponding strain isotherm (b) of the sample *Sint850*. Full symbols denote experimental adsorption, open symbols experimental desorption. The red solid line is the result of the theoretical modeling. The red dot in the theoretical strain isotherm marks the point of capillary condensation.

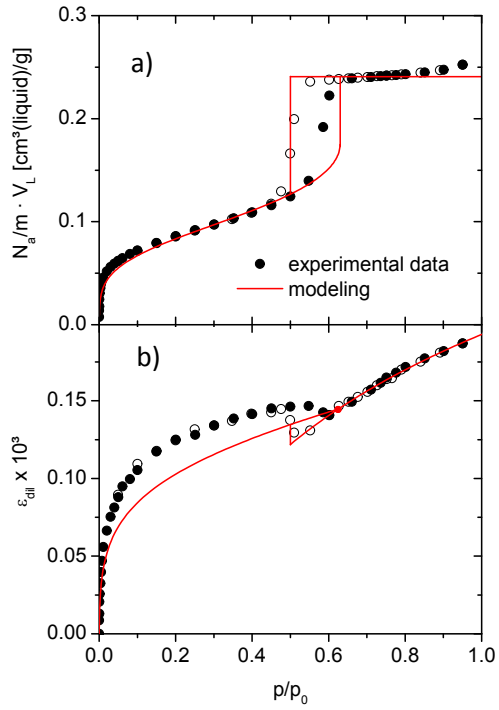


Figure S3:  $N_2$  adsorption isotherm at 77 K (a) and corresponding strain isotherm (b) of the meso-macroporous sample *Sint950*. Full symbols denote experimental adsorption, open symbols experimental desorption. The red solid line is the result of the theoretical modeling. The red dot in the theoretical strain isotherm marks the point of capillary condensation.

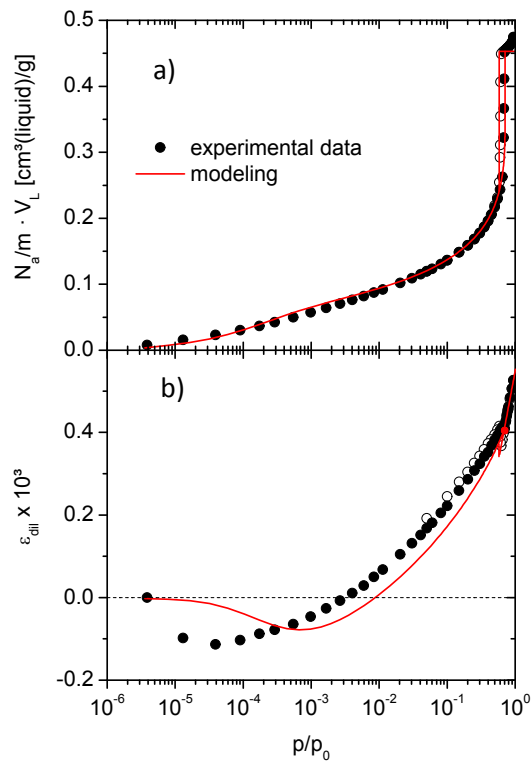


Figure S4: Experimental data (dots) and modeling (red lines) for sample *Sint750*, on a logarithmic relative pressure scale.

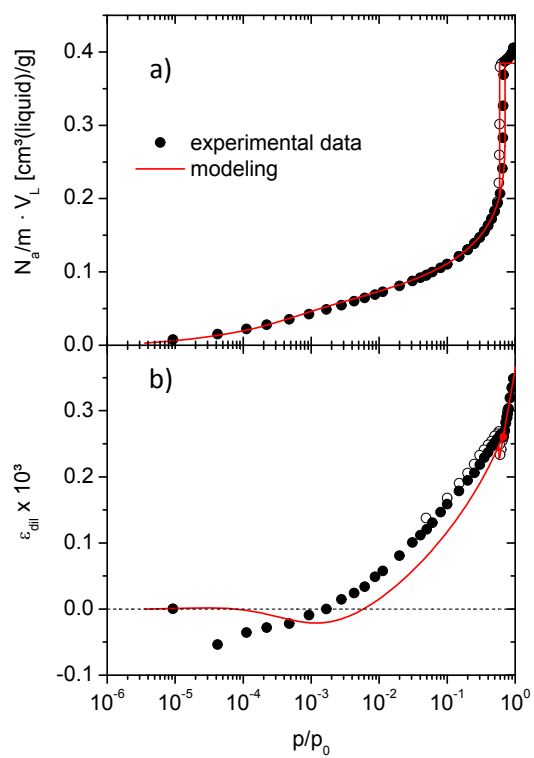


Figure S5: Experimental data (dots) and modeling (red lines) for sample *Sint850* on a logarithmic relative pressure scale.