Supplementary Materials: A Reliable Method for the Preparation of Multiporous Alumina Monoliths by Ice-Templating

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Acid Source and Acid/Al Ratio

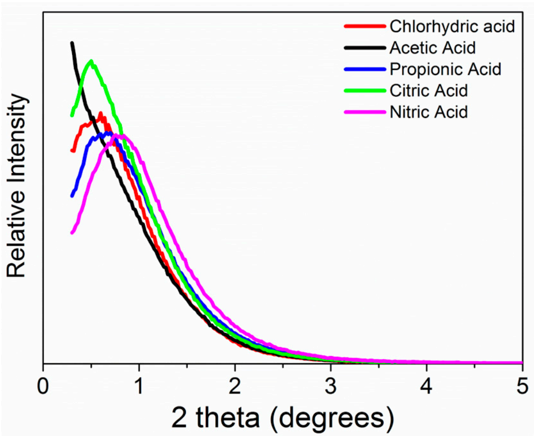


Figure S1. Small angle XRD for samples synthesized using different peptizing acids.

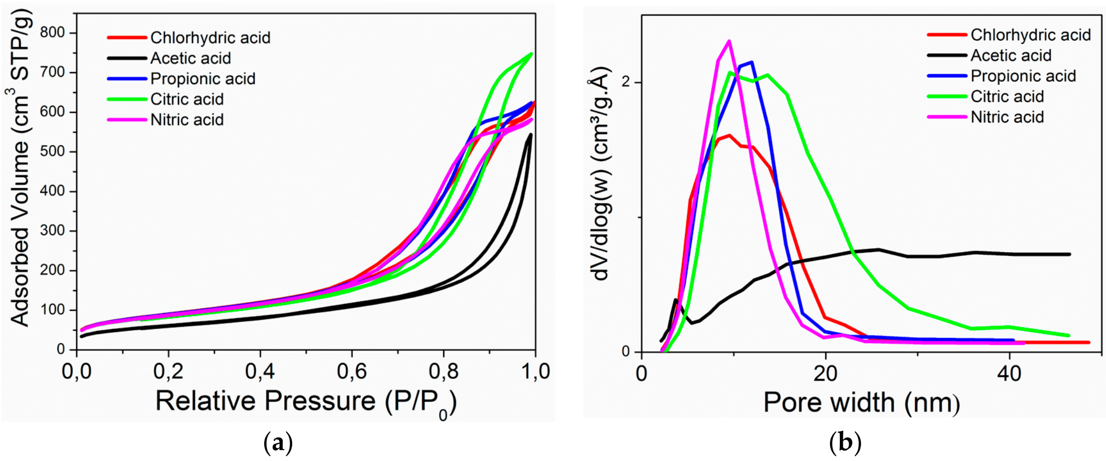


Figure S2. (**a**) Nitrogen adsorption—desorption isotherms and (**b**) pore size distributions (desorption branch) for samples synthesized using different peptizing acids.

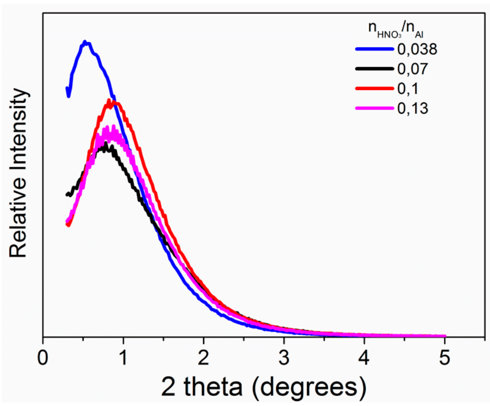


Figure S3. Small angle XRD for samples synthesized using different concentrations of nitric acid.

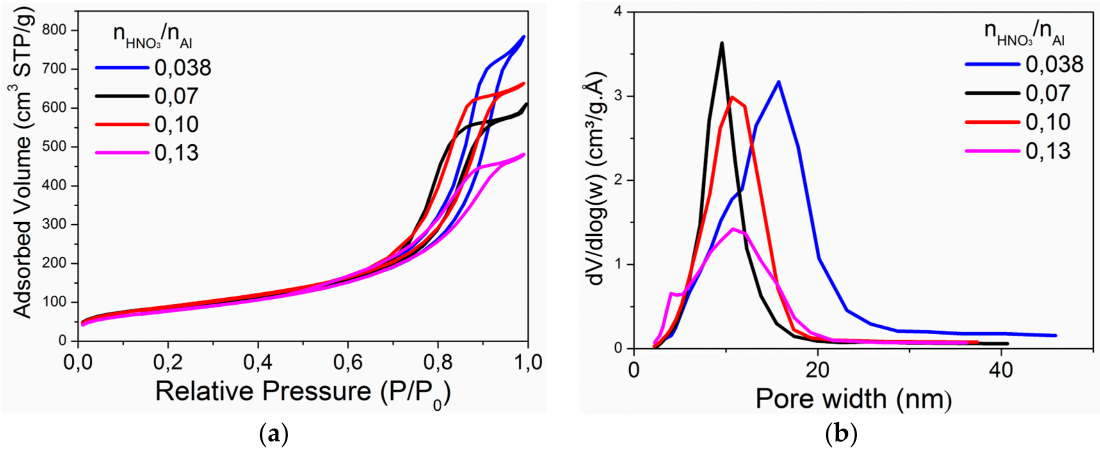


Figure S4. (**a**) Nitrogen adsorption—desorption isotherms and (**b**) pore size distributions for samples synthesized using different HNO_3/Al ratios.

Impact of Peptizing Duration and Temperature

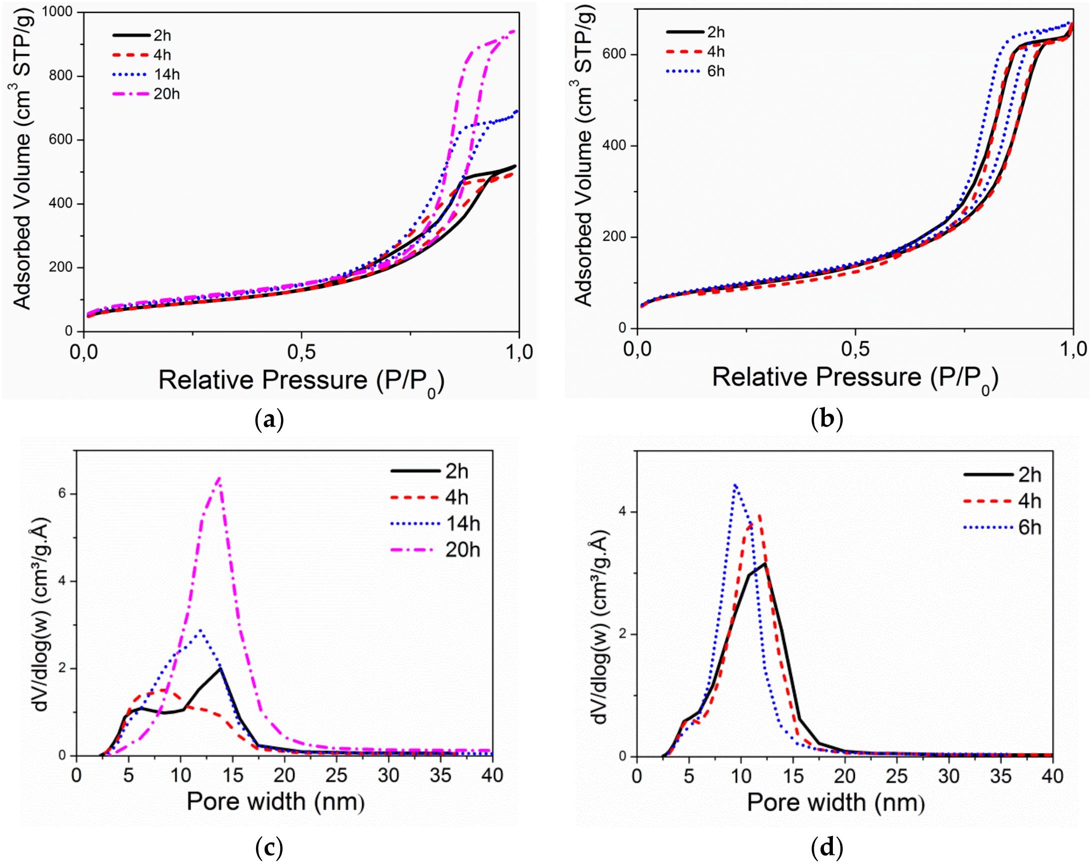
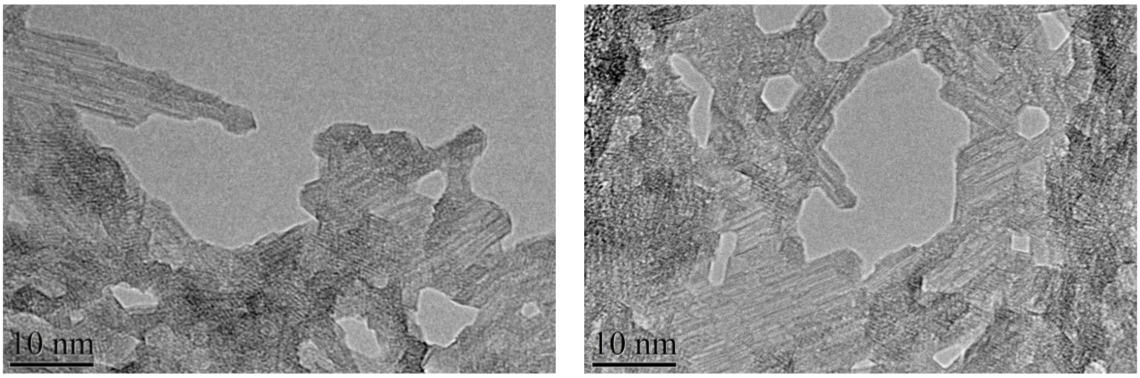


Figure S5. (**a**,**b**) Nitrogen adsorption—desorption isotherms and (**c**,**d**) pore size distributions for samples synthesized at (**a**,**c**) 85 °C and (**b**,**d**) 100 °C.



(**a**) (**b**)

Figure S6. TEM images of the pseudoboehmite respectively after (**a**) 20 h at 85 °C and (**b**) 6 h at 100 °C.

Powder/Monolith Comparison

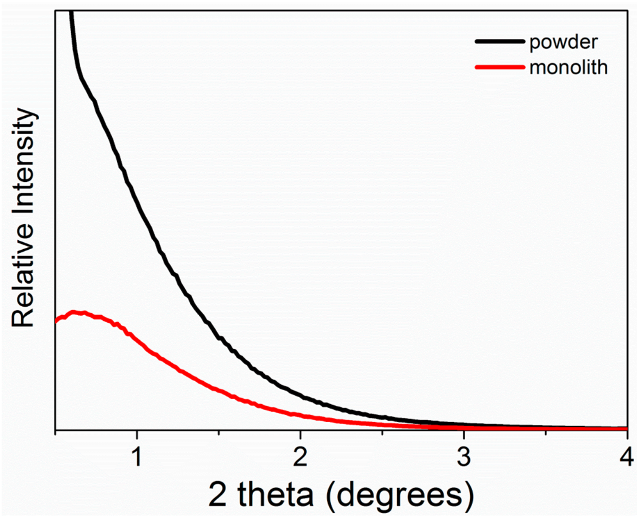
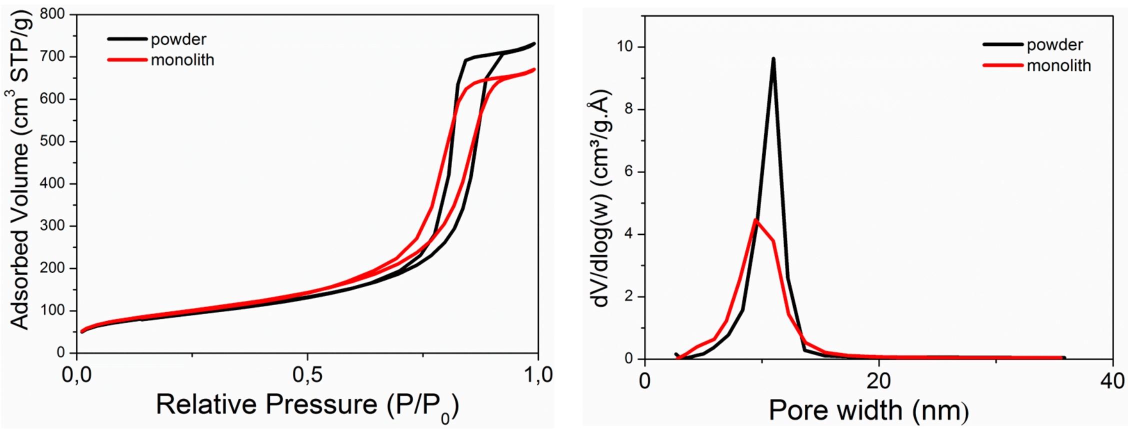


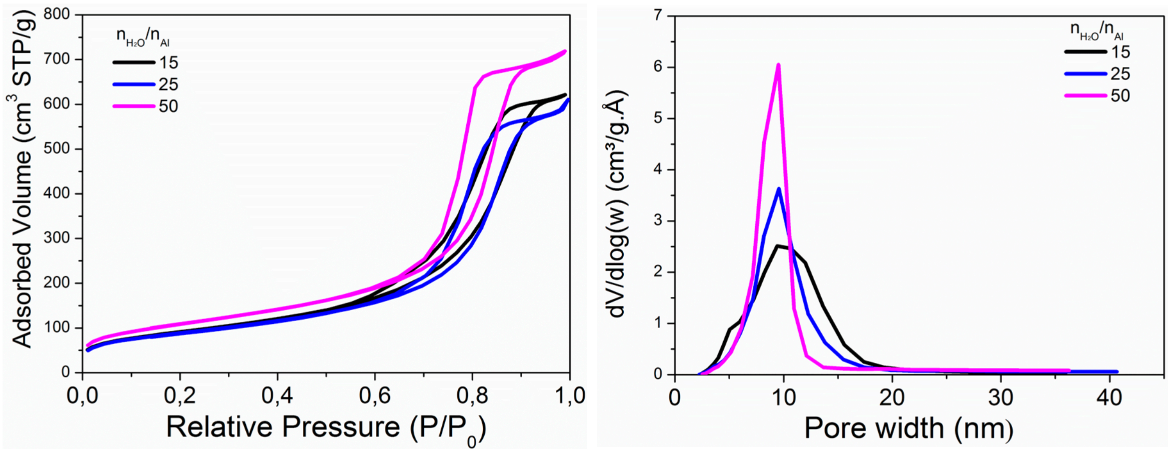
Figure S7. Comparative small angle XRD of powder and monolith synthesized under optimized conditions.



(**a**) (**b**)

Figure S8. Comparative (**a**) Nitrogen adsorption—desorption isotherms and (**b**) corresponding pore size distributions of powder and monolith synthesized under optimized conditions.

Water Content



(**a**) (**b**)

Figure S9. Impact of water content on (**a**) Nitrogen adsorption—desorption isotherms and (**b**) corresponding pore size distributions.

Thermal Treatment

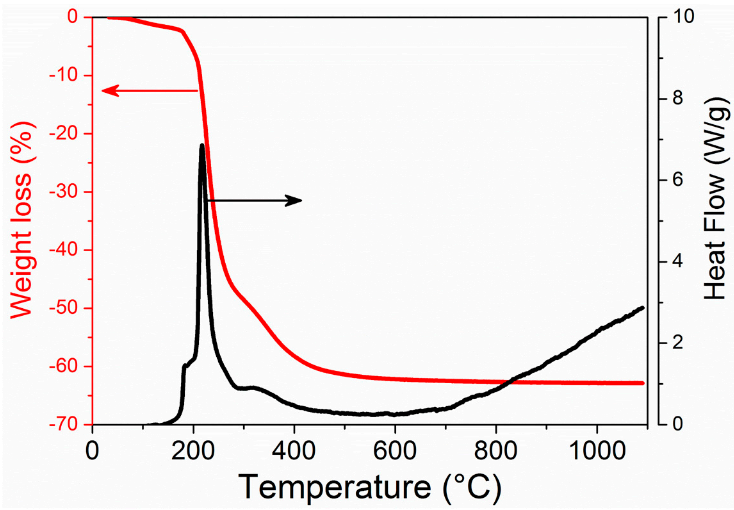
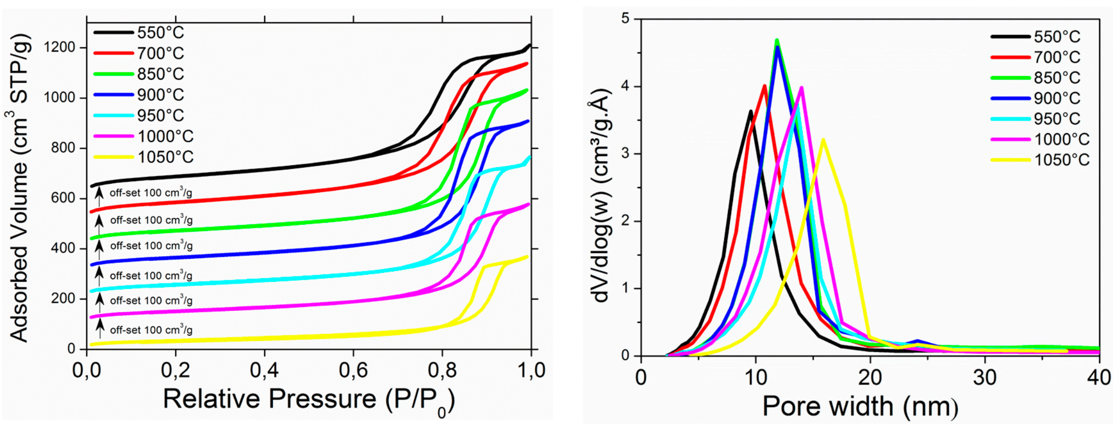


Figure S10. TGA-DSC analysis of ice-templated sample after sublimation of the ice crystals. An intense exothermic peak is typical of organics combustion.



(**a**) (**b**)

Figure S11. Impact of the thermal treatment (**a**) Nitrogen adsorption—desorption isotherms and (**b**) pore size distribution.

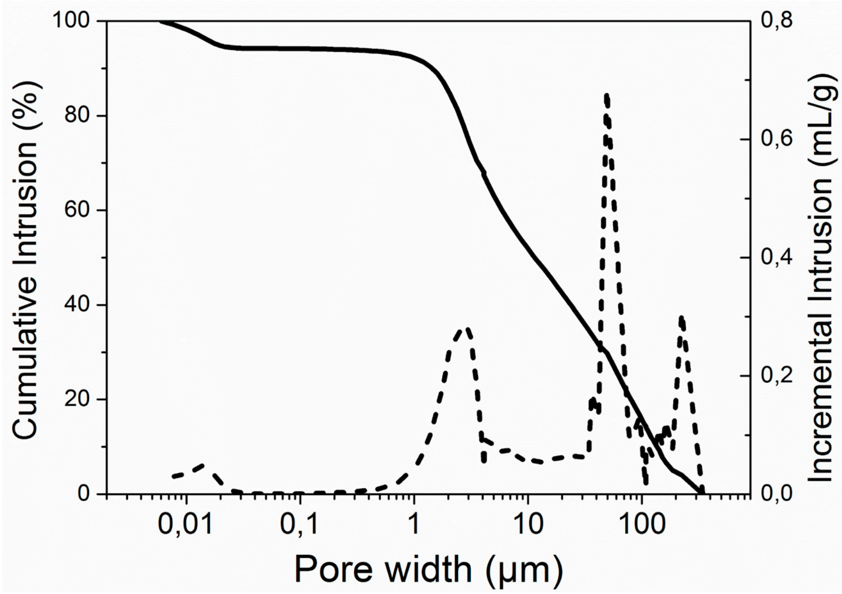


Figure S12. Mercury porosimetry of alumina monolith.