Electronic supplementary information

Sol-Gel processes at the droplet interface: Hydrous zirconia and hafnia nanocapsules by interfacial inorganic polycondensation

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1. TEM investigation of the capsule formation



Figure S1. TEM micrographs of (a) zirconium hydroxide and (b) hafnium hydroxide products obtained at different times after the prompt addition of triethylamine.

2. Influence of the dropping rate of the organic base



Figure S2. TEM micrographs of (a) zirconium hydroxide and (b) hafnium hydroxide products obtained with different dropping rates of the triethylamine (products collected after 4 hours of after starting the addition of triethylamine).

3. Influence of the solubility in water of the organic base



Figure S3. SEM (left) and TEM (right) micrographs of a sample prepared by addition of methylamine to a HfOCl2containing water-in-oil miniemulsion.



Figure S4. TEM micrographs of (a) zirconium and (b) hafnium hydroxide samples prepared by prompt addition of tributylamine.

4. XRD patterns of a sample before and after washing



Figure S5. XRD patterns of a hafnium-containing sample as-prepared and after washing with acetone and water. Vertical lines indicate the position and relative intensity of the reflections of triethylamine hydrochloride (JCPDS Card No. 38-1974).



5. Energy dispersive X-ray (EDX) spectroscopy

Figure S6. Energy-dispersive X-ray (EDX) spectra of a hafnium-containing sample after washing with acetone and water. Atomic composition (normalized at. %): C (19.7), O (58.8), Cl (4.5), Hf (17.0).



Figure S7. Energy-dispersive X-ray (EDX) spectra of a hafnium-containing sample after calcinations at 600 °C. Atomic composition (normalized at. %): C (6.5), O (65.6), Hf (27.9).

6. Reference absorption and photoluminescence emission spectra



Figure S8. Absorption and photoluminescence emission ($\lambda_{exc} = 420 \text{ nm}$) spectra of an aqueous solution of albumin-fluorescein isothiocyanate (FTIC) conjugate (2 g·L⁻¹) and a solution containing the same concentration of FTIC and triethylamine hydrochloride (2.67 mmol per gramm of solvent).