

Supporting Information for :

Tuning the nanostructure of highly functionalized
silica using amphiphilic organosilanes: Curvature
agent effects.

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Table S1. Solution, sol-gel catalyst and curvature agent used for the preparation of the samples.

Samples	Solution	Sol-gel catalyst	Curvature agent	C.agent/AUT ratio
H0	Water	*pH=11	-	-
H0-Cl_b	HCl _{aq} (pH=1.5)	*pH=10.9	HCl	0.3
H0-Cl_a	HCl _{aq} (pH=0.86)	*pH=1.5	HCl	1.4
H0-CO₂	HCl _{aq} (pH=1.5)	*pH=1.5	CO ₂	flow
H0-Ac	Water	Acetic Acid	Acetic Acid	1
H0-Piv	Water	Pivalic Acid	Pivalic Acid	1
H0-Val	Water	Valproic Acid	Valproic Acid	1

*pH values calculated taking into account the free amino group (pKa=10.6) for the H0 and the H0Cl_b samples and the free hydrochloric acid for the H0-Cl_a and the H0-CO₂ samples.

Table S2. Observations on samples in solution and after filtration and drying.

Samples	Observations	
	in solution	solid
<i>H0</i>	precipitation	white powder
<i>H0-Cl_b</i>	precipitation	white powder
<i>H0-Cl_a</i>	suspension	-
<i>H0-CO₂</i>	precipitation	white powder
<i>H0-Ac</i>	clear solution	-
<i>H0-Piv</i>	clear solution	-
<i>H0-Val</i>	white solid	clear soft

Table S3. DLS results obtained on suspensions H0-Cla, H0-Ac and H0-Piv.

		D1h	D2h	D3h	PDI
H0-Cla	Dh (nm)	130	-	-	0.4
	Area int.*	1.0	-	-	
H0-Ac	Dh (nm)	107	11	1.1	0.33
	Area int.*	0.92	0.02	0.06	
H0-Piv	Dh (nm)	507	34	1.3	0.43
	Area int.*	0.12	0.37	0.51	

*Area integration obtained from scattering intensities.

For DLS measurements, the error on Dh (hydrodynamic diameter) was principally due to the viscosity, the turbidity, the anisotropy and dispersity. DLS measurements were performed in triplicate.

The PDI values (polydispersity indexes) reported in the table illustrate the corresponding standard deviations.

Table S4. Calculated values of volume (V_0), radius (R_0), and area (a_0) of the different ammonium polar head and condensed siloxane head. Packing parameter values P_0 calculated with $V_c=0.297\text{nm}^3$ and $l_c=1.397\text{ nm}^3$. A schematic representation of the polar side of each complex is given under the table.

	SiO_{1.5}	No agent	½ CO₂	HCl	Acetic acid	Pivalic acid	Valproic acid
V₀ nm ³	0.0415	0.0316	0.0540	0.0565	0.133	0.246	0.299
R₀ nm	0.215	0.196	0.234	0.238	0.317	0.389	0.415
a₀ nm ²	0.145	0.121	0.173	0.178	0.315	0.474	0.541
P₀		1.76	1.19	1.23	0.68	0.45	0.39

Figure S1. SEM images of materials a) H0, b) H0-CO₂, and c) H0-Cl_b.

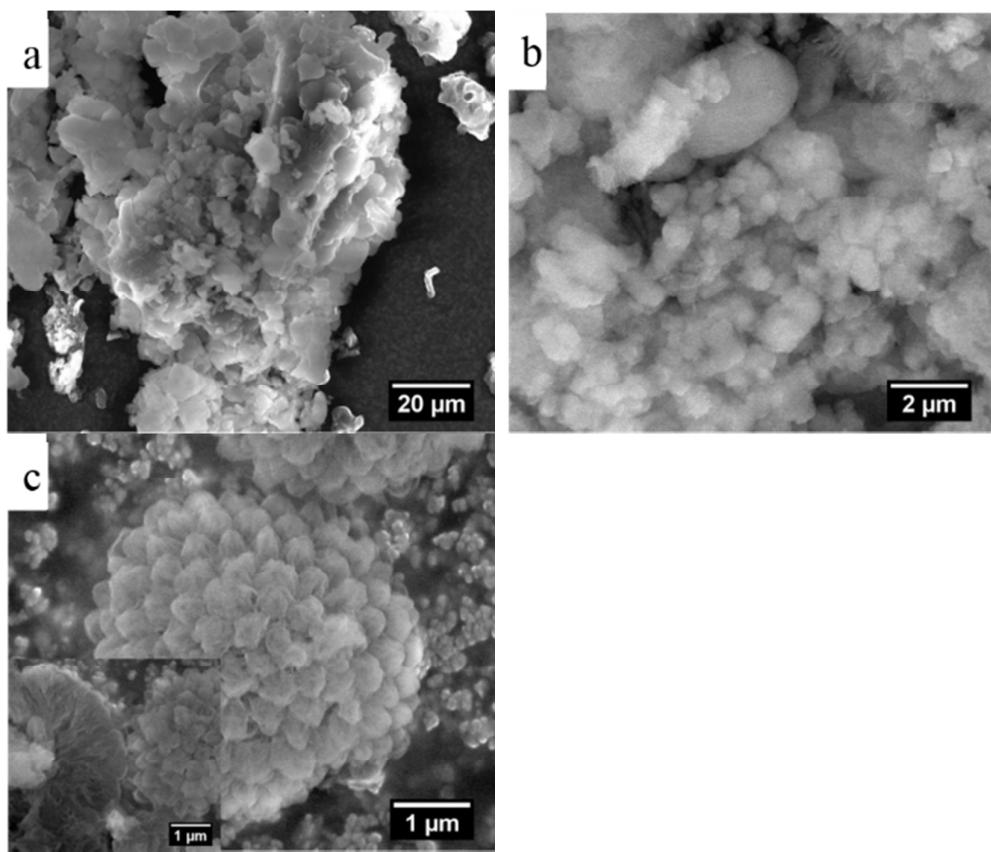


Figure S2. Schematic representation of multi-lamellar vesicles H0-Ac.

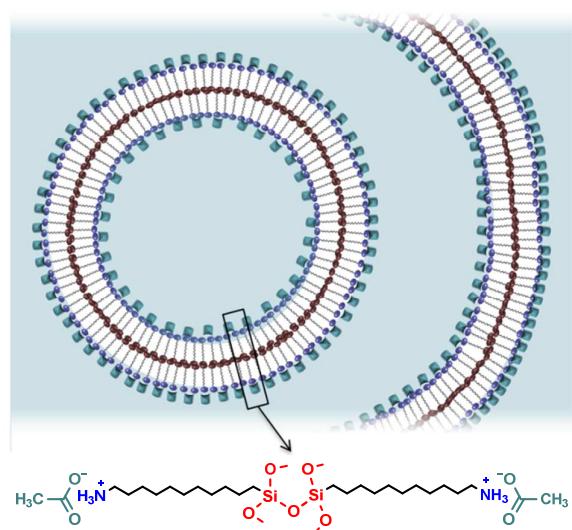


Figure S3. Transmission optical microscopy images of H0-Val with crossed polarizers at a) 0° on starting material, b) 0° , c) 45° , d) 90° and e) 135° on stretched material.

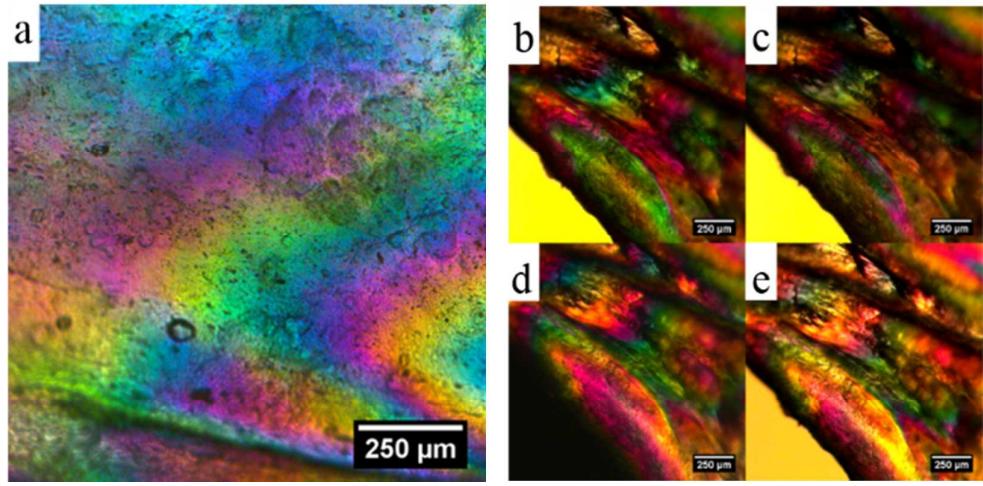


Figure S4. HRTEM image of the H0-Val material. Inset high magnification with the periodic distance of these stripe patterns.

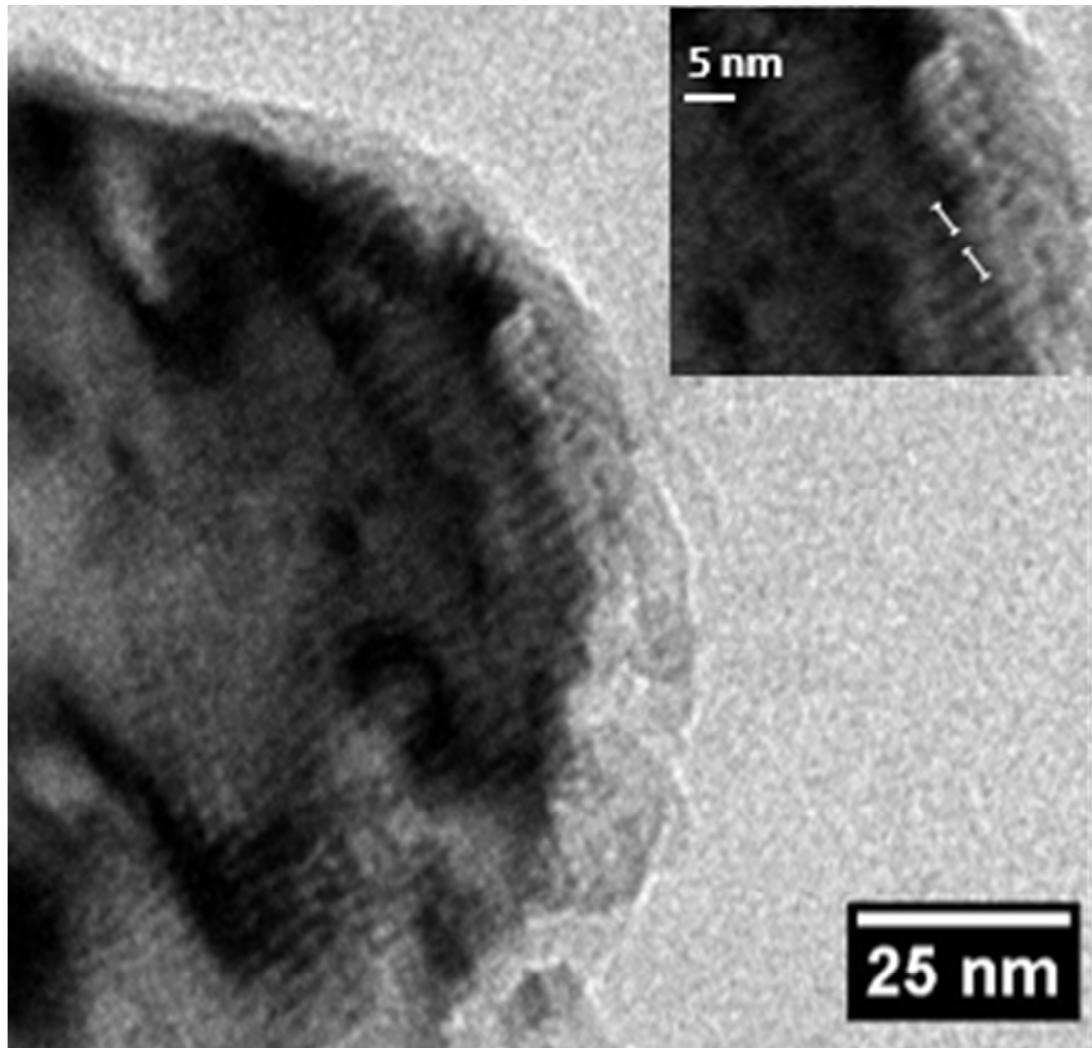


Figure S5. Solid state ^{29}Si NMR spectrum of the H0-Val material.

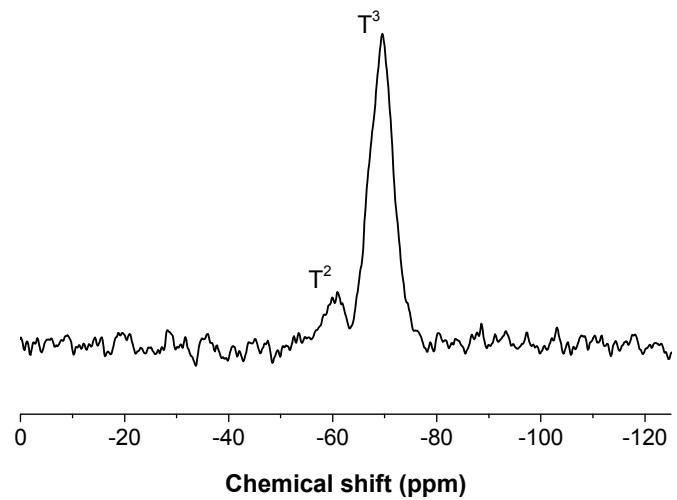


Figure S6. Thermal analysis of the H0-Val material.

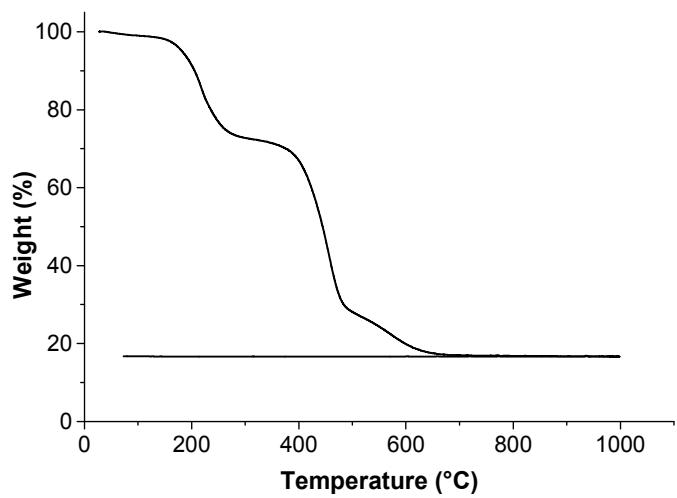


Figure S7. Schematic representation of the considered amphiphilic organosilane and the different possibilities of potential aggregates depending of the packing parameter values. Red: siloxane head; blue: polar head

