

# **Supporting Information**

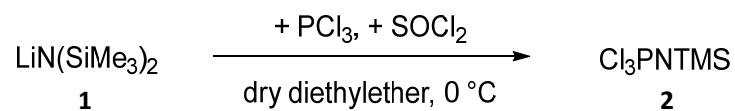
## **Hollow silica microparticles based on amphiphilic polyphosphazenes**

Yolanda Salinas\*, Vanessa Poscher, Oliver Brüggemann, and Ian Teasdale

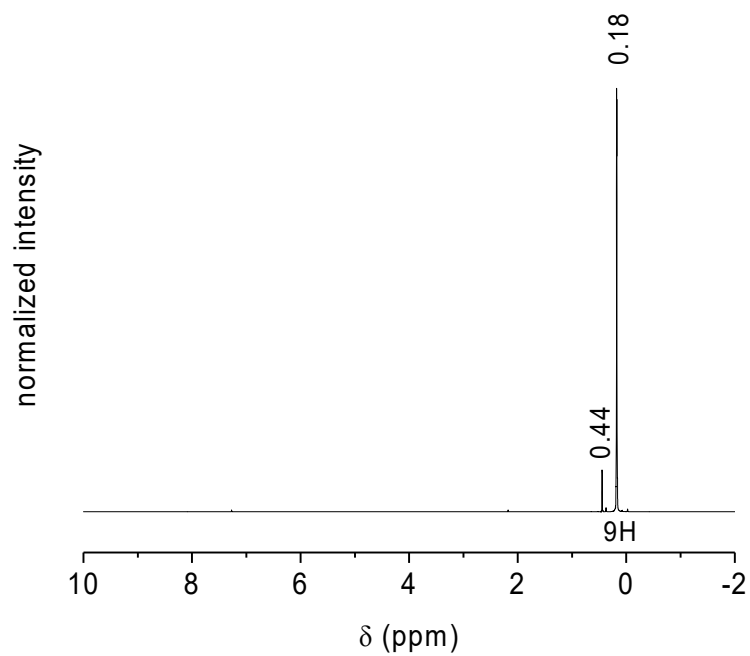
Institute of Polymer Chemistry and Linz Institute of Technology, Johannes Kepler University  
Linz, Altenberger Straße 69, 4040 Linz, Austria.

\*Correspondence E-mail: [yolanda.salinas@jku.at](mailto:yolanda.salinas@jku.at)

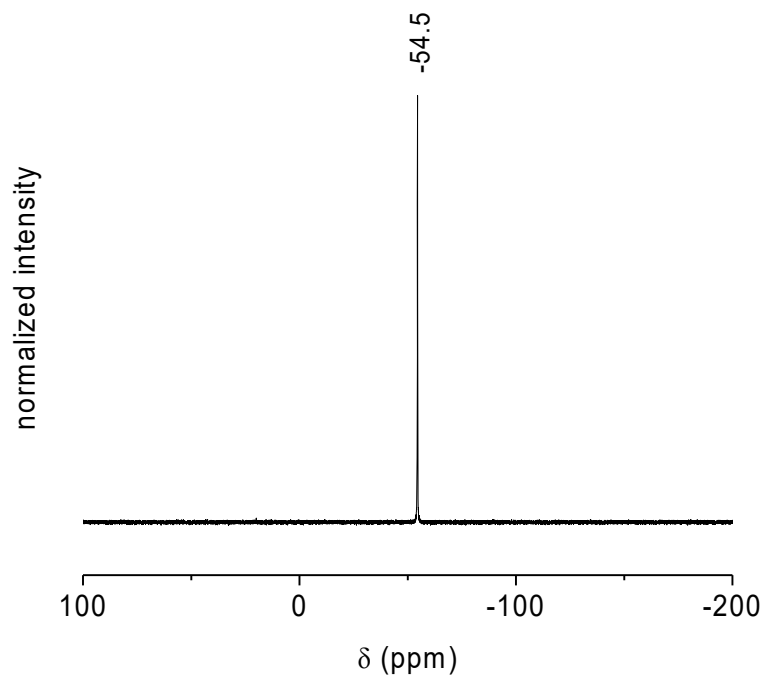
## Synthesis and NMR characterization of Cl<sub>3</sub>PNTMS



**Figure S1.** Synthesis of the Cl<sub>3</sub>PNSiMe<sub>3</sub> monomer.

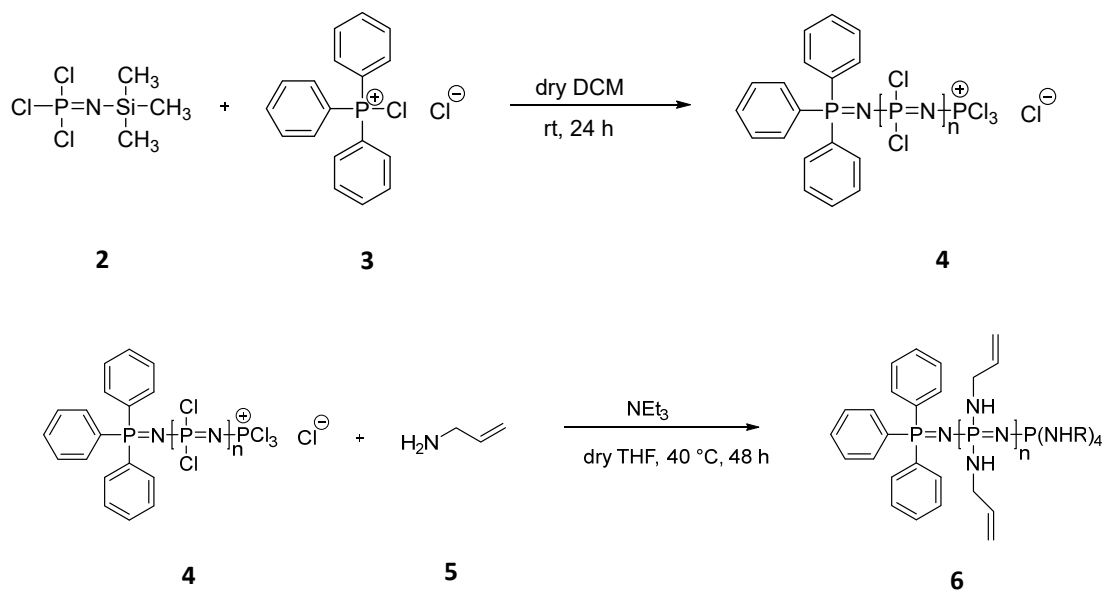


**Figure S2.** <sup>1</sup>H-NMR spectrum of **2** (monomer Cl<sub>3</sub>PNTMS) in CDCl<sub>3</sub>.

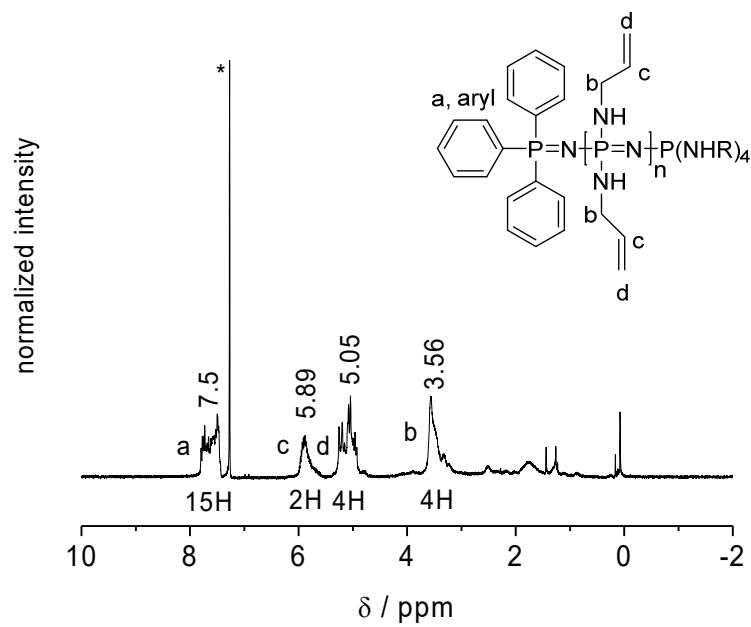


**Figure S3.**  $^{31}\text{P}$ -NMR spectrum of **2** (monomer  $\text{Cl}_3\text{PNTMS}$ ) in  $\text{CDCl}_3$ .

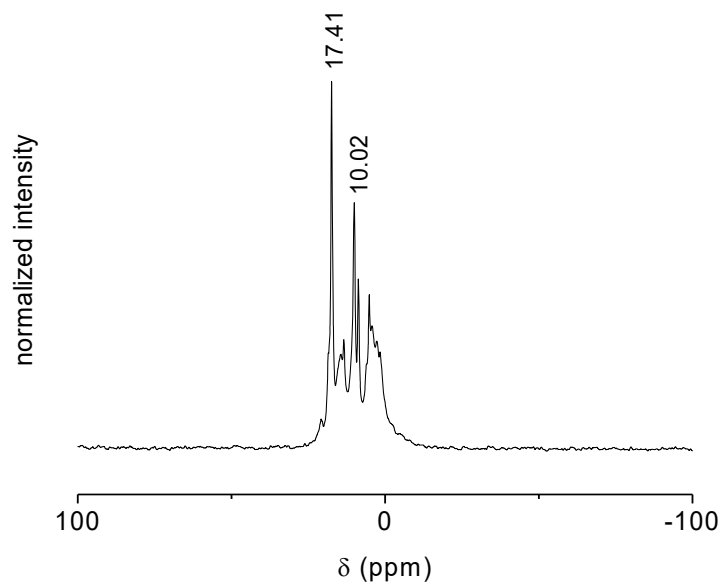
### Synthesis and NMR characterization of poly[bis(allylamino)phosphazene]



**Figure S4.** Synthesis of linear poly[bis(allylamino)phosphazene] **6** ( $n \sim 5$ ).

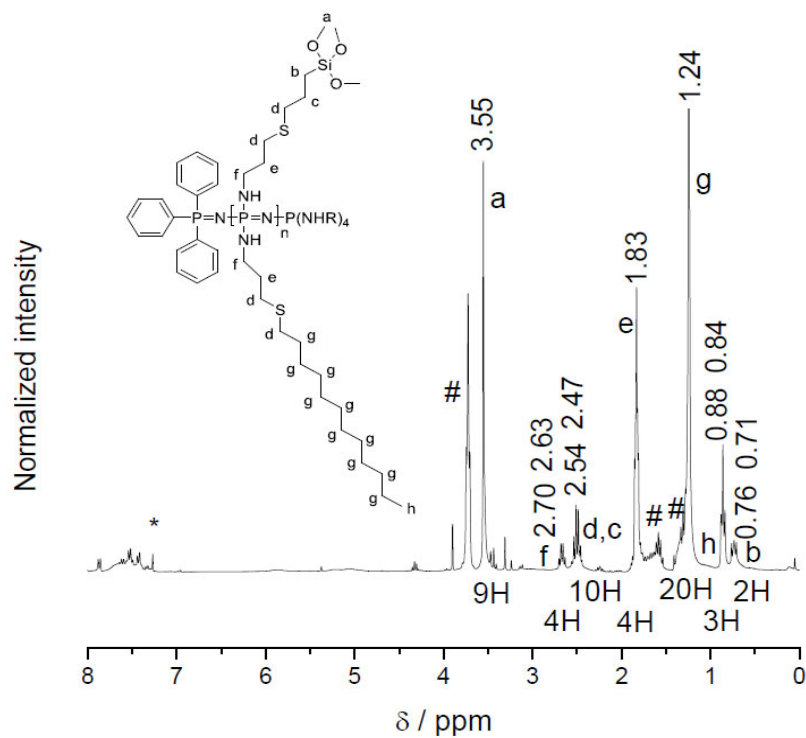


**Figure S5.**  $^1\text{H}$ -NMR spectrum of **6** ( $n \sim 5$ ) in  $\text{CDCl}_3$  (\*).

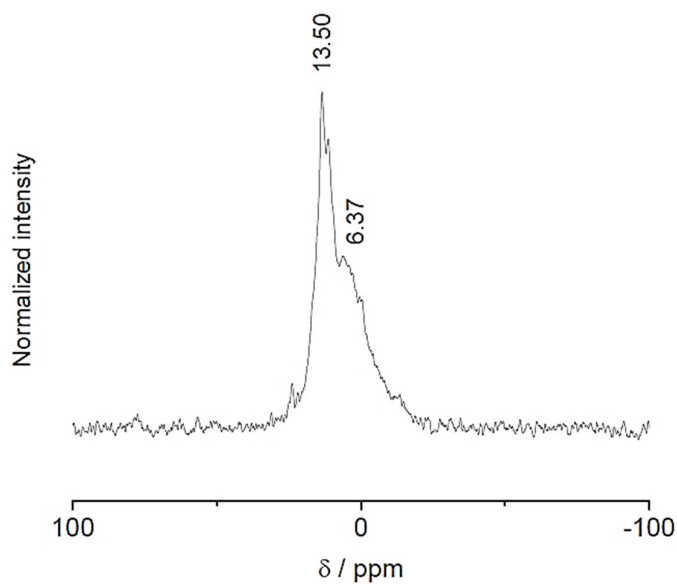


**Figure S6.**  $^{31}\text{P}$ -NMR spectrum of **6** ( $n \sim 5$ ) in  $\text{CDCl}_3$ .

## Synthesis and NMR characterization of the silane derived linear polyphosphazene

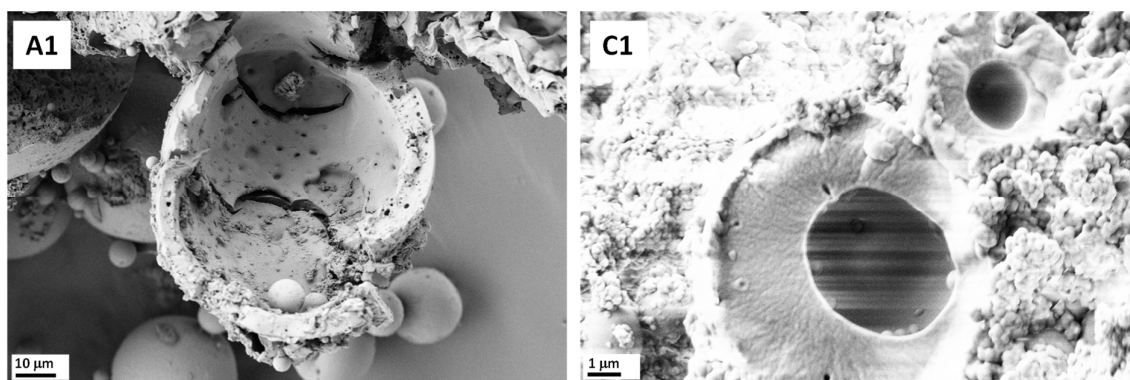


**Figure S7.**  $^1\text{H}$ -NMR spectrum of the silane derived polyphosphazene precursor after UV reaction using two different thiols in CDCl<sub>3</sub> (\*). EtOH peaks (#) present and overlapping with peaks from the silane precursor.

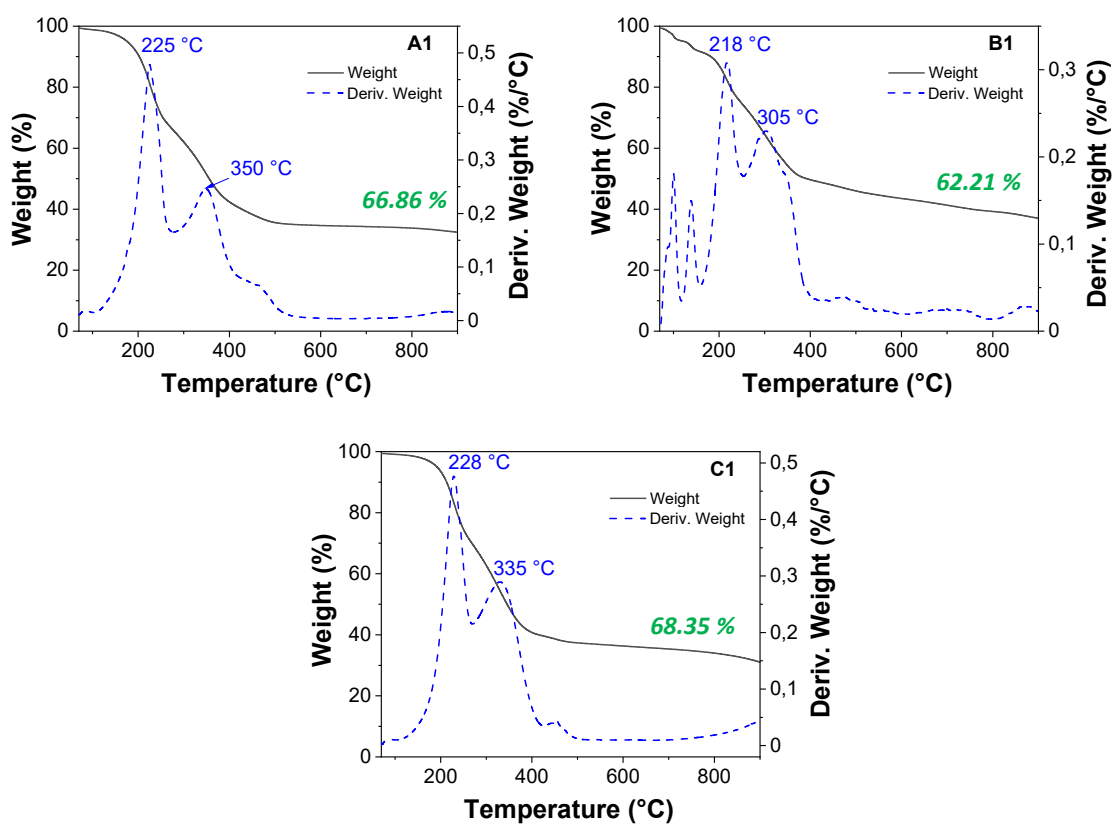


**Figure S8.**  $^{31}\text{P}$ -NMR spectrum of the silane derived phosphazene precursor after UV reaction using two different thiols.

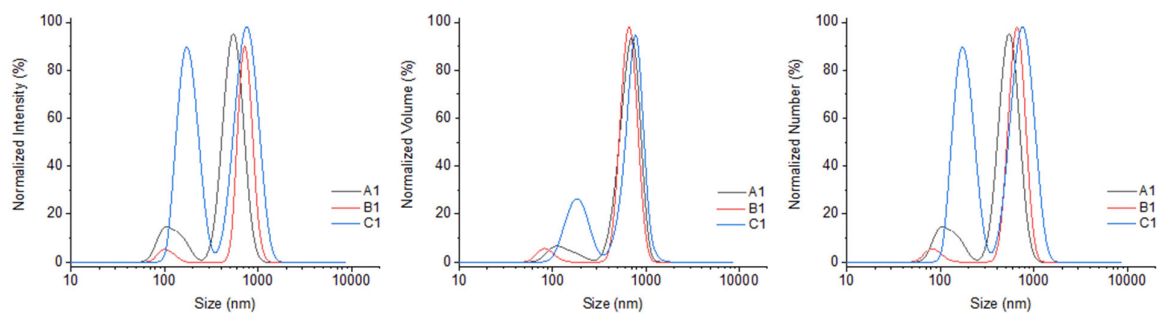
## Microparticles characterization



**Figure S9.** SEM images of hollow silica microparticles obtained using different amounts of base, with 8 and 4 mL of NaOH (2M) yielding to microparticles A1 and C1, respectively, scale 10  $\mu\text{m}$  (left (A1)) and 1  $\mu\text{m}$  (and right (C1)).



**Figure S10.** TGA of the silica-based particles



**Figure S11.** DLS of silica-based particles A1-C1 in intensity, volume and number (%)

**Table S1.** DLS size distribution (hydrodynamic diameter average) of the silica-based microparticles A1-C1 collected after centrifugation

Particles	Intensity		Volume		Number	
	D <sub>h1</sub> (nm)	D <sub>h2</sub> (nm)	D <sub>h1</sub> (nm)	D <sub>h2</sub> (nm)	D <sub>h1</sub> (nm)	D <sub>h2</sub> (nm)
<b>A1</b>	635±139	152±28	680±147	150±33	598±144	134±28
<b>B1</b>	653±97	87±8	691±123	86±12	646±120	84±11
<b>C1</b>	734±158	158±27	740±142	157±33	676±142	144±29