

Supplementary Materials to the manuscript

The Reaction of the $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ Building Block with Silyl Chlorides: A New Synthetic Methodology for Preparing Nanostructured Building Block Solids

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Figure S1

^{29}Si Solid state NMR (SSNMR) spectra (MAS) of the product from the reaction of HSiCl_3 with $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ in hexane with varying initial stoichiometries of $\text{HSiCl}_3 : \text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$

Figure S2

^{29}Si Solid state NMR (SSNMR) spectra (MAS) of the product from the reaction of Me_2SiCl_2 with $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ in toluene with varying initial stoichiometries of $\text{Me}_2\text{SiCl}_2 : \text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$

Figure S3

^{29}Si Solid state NMR (SSNMR) spectra (MAS) of the product from the reaction of Me_2SiCl_2 with $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ in hexane with varying initial stoichiometries of $\text{Me}_2\text{SiCl}_2 : \text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$

Figure S4

BJH pore volume distribution for the reaction of HSiCl_3 and $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ in toluene. This pore size distribution is typical of all the high surface area solids investigated in these studies.

Figure S5

^{29}Si SSNMR (MAS and CPMAS) of a nanostructure solid containing only “embedded” $\text{Me}_2\text{Si}(\text{OSi}\equiv)_2$ groups linking Si_8O_{20} building blocks. SiCl_4 -derived linking groups are also present in the matrix.

Figure S6

^{29}Si SSNMR (MAS and CPMAS) of a nanostructure solid containing only “surface” $\text{Me}_2\text{SiCl}(\text{OSi}\equiv)$ groups linking Si_8O_{20} building blocks. SiCl_4 -derived linking groups are also present in the matrix.

Table S1

BET Surface area analysis of the solids resulting from the reaction of Me_2SiCl_2 with $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ under the conditions given. Absorption gas: nitrogen. Pore size distributions calculated using standard BJH equations.

Table S2

BET Surface area analysis of the solids resulting from the reaction of HSiCl_3 with $\text{Si}_3\text{O}_2\text{O}_{20}(\text{SnMe}_3)_8$ under the conditions given. Absorption gas: nitrogen. Pore size distributions calculated using standard BJH equations.

Figure S1

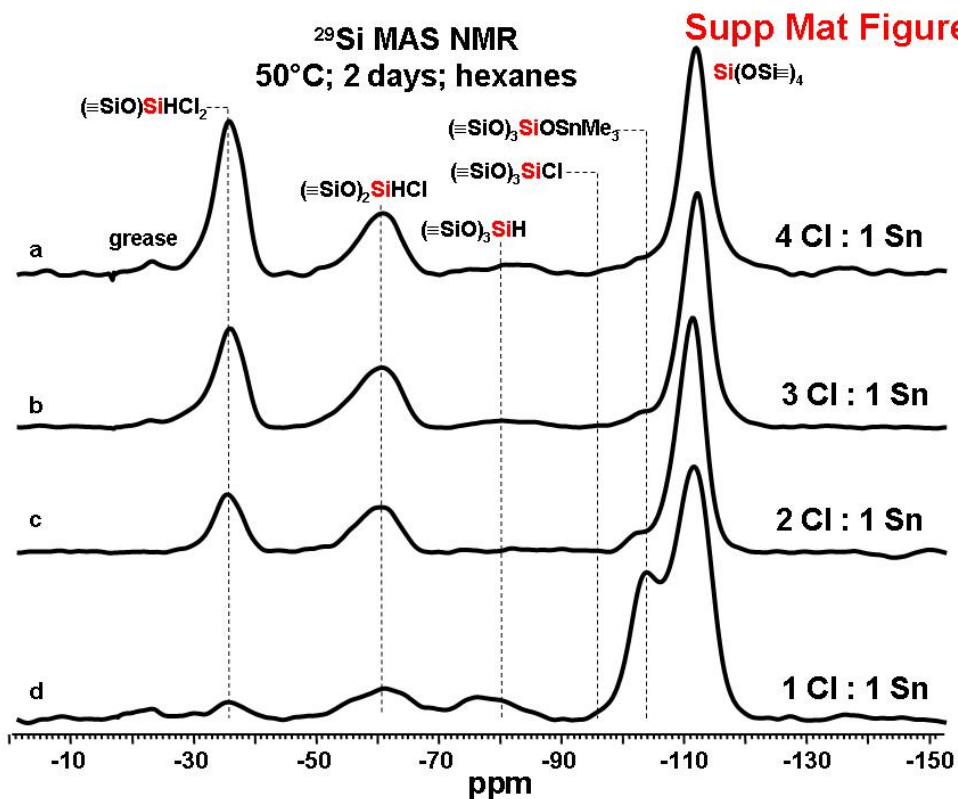


Figure S2

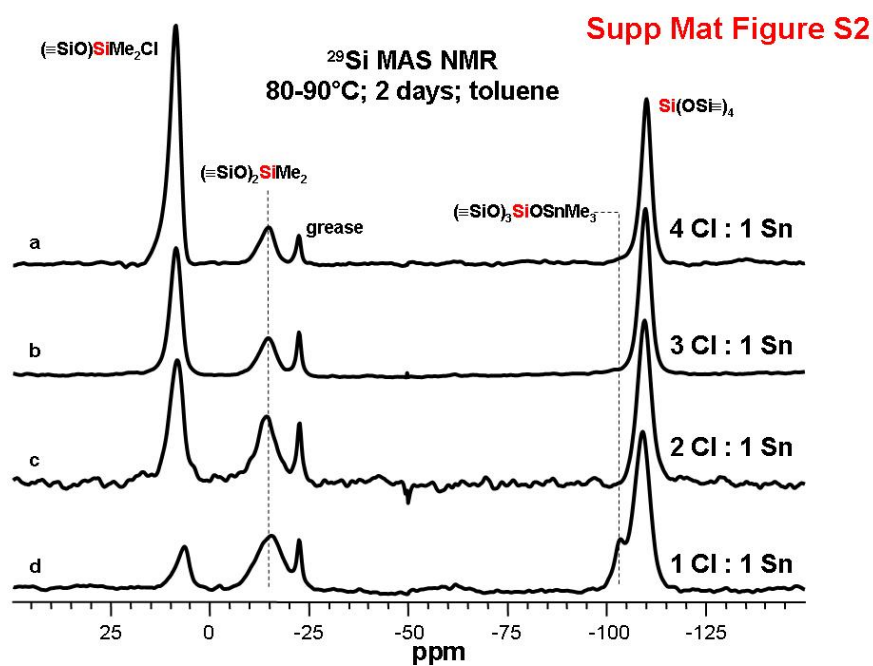


Figure S3

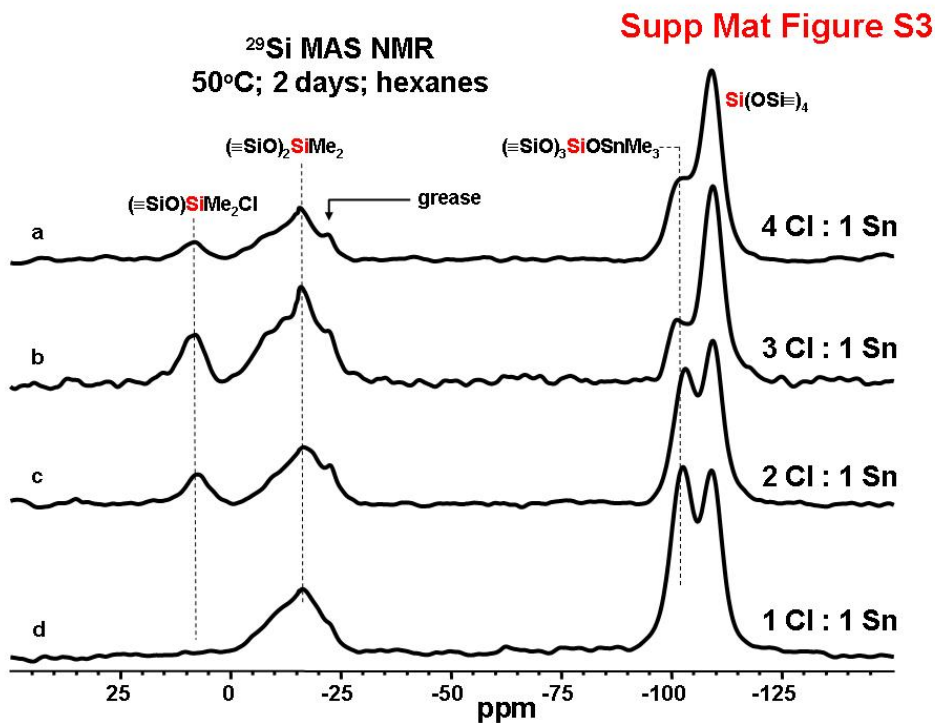


Figure S4

Supp Mat Figure S4

BJH pore volume distribution for the reaction of HSiCl_3 and $\text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ in toluene
Total surface area: $672 \text{ m}^2/\text{g}$

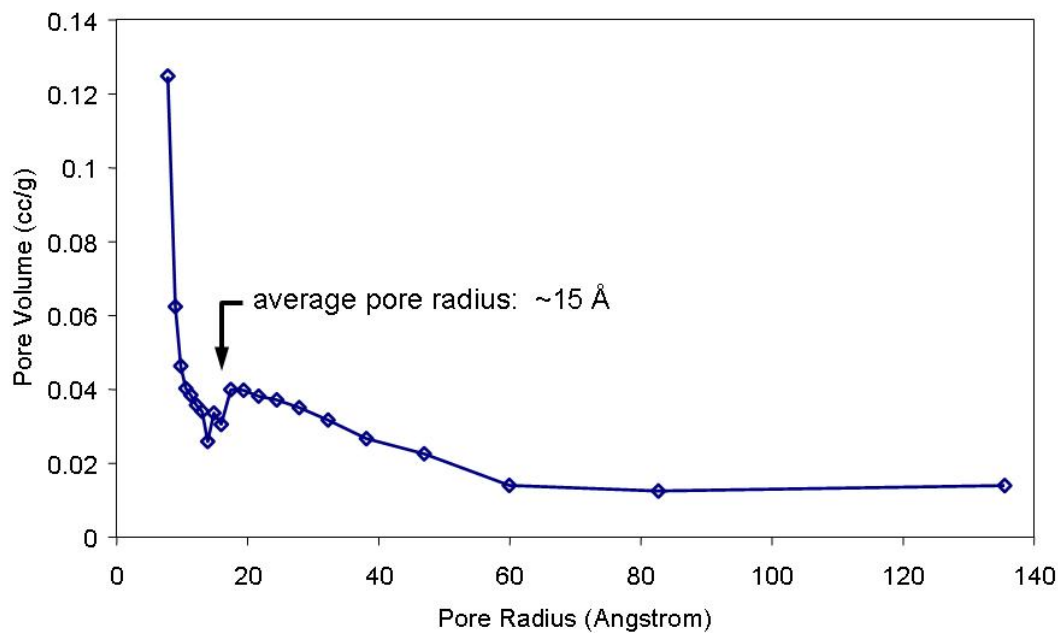


Figure S5

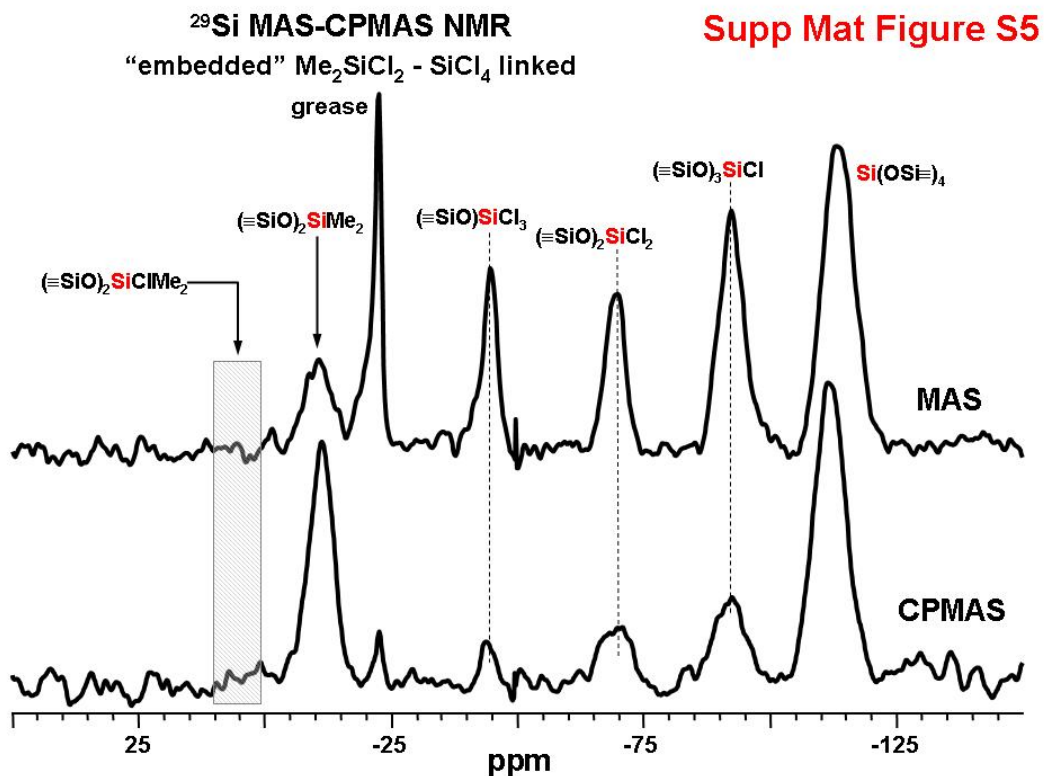


Figure S6

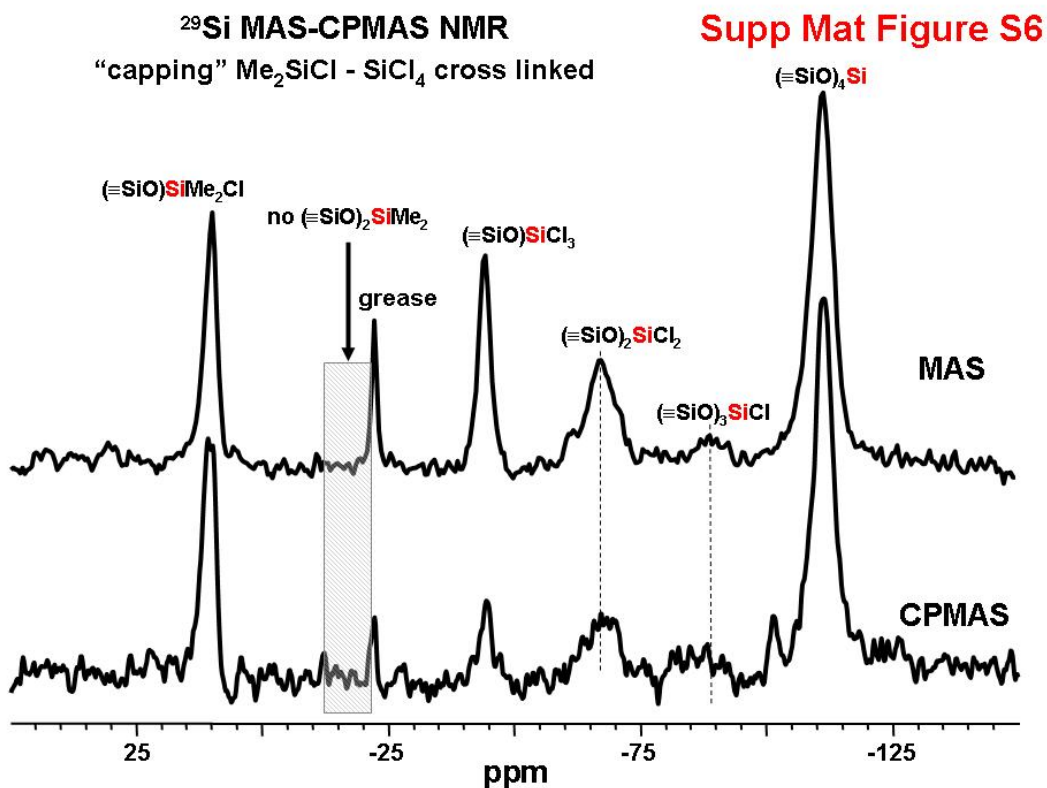


Table S1**Supp Mat Table S1**

Table S1 BET Surface area analysis of the solids resulting from the reaction of $\text{Me}_2\text{SiCl}_2 + \text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ under the conditions given. Absorption gas: nitrogen. Pore size distributions calculated using standard BJH equations.

Conditions	Cl:Sn	Surface Area (m ² /g)	Total Pore Volume (cc/g)	Average Pore Radius (Å)
Toluene, 80-90°C, 2 days	4:1	low	low	low
Toluene, 80-90°C, 2 days	3:1	low	low	low
Toluene, 80-90°C, 2 days	2:1	172	0.150	17
Toluene, 80-90°C, 2 days	1:1	669	0.496	15
Hexanes, 50°C, overnight	4:1	13	0.015	24
Hexanes, 50°C, overnight	3:1	29	0.171	13
Hexanes, 50°C, overnight	2:1	12	0.010	19
Hexanes, 50°C, overnight	1:1	14	0.021	30

Table S2**Supp Mat Table S2**

Table S2 BET Surface Area Analysis of the solids resulting from the reaction of $\text{HSiCl}_3 + \text{Si}_8\text{O}_{20}(\text{SnMe}_3)_8$ under the conditions given. Absorption gas: nitrogen. Pore size distributions calculated using standard BJH equations.

Conditions	Cl:Sn	Surface Area (m ² /g)	Total Pore Volume (cc/g)	Average Pore Radius (Å)
Toluene, 80-90°C, 2 days	4:1	low	low	low
Toluene, 80-90°C, 2 days	3:1	558	0.400	14
Toluene, 80-90°C, 2 days	2:1	660	0.513	16
Toluene, 80-90°C, 2 days	1:1	672	0.539	16
Hexanes, 50°C, overnight	4:1	336	0.243	14
Hexanes, 50°C, overnight	3:1	324	0.254	16
Hexanes, 50°C, overnight	2:1	401	0.295	15
Hexanes, 50°C, overnight	1:1	58	0.046	16