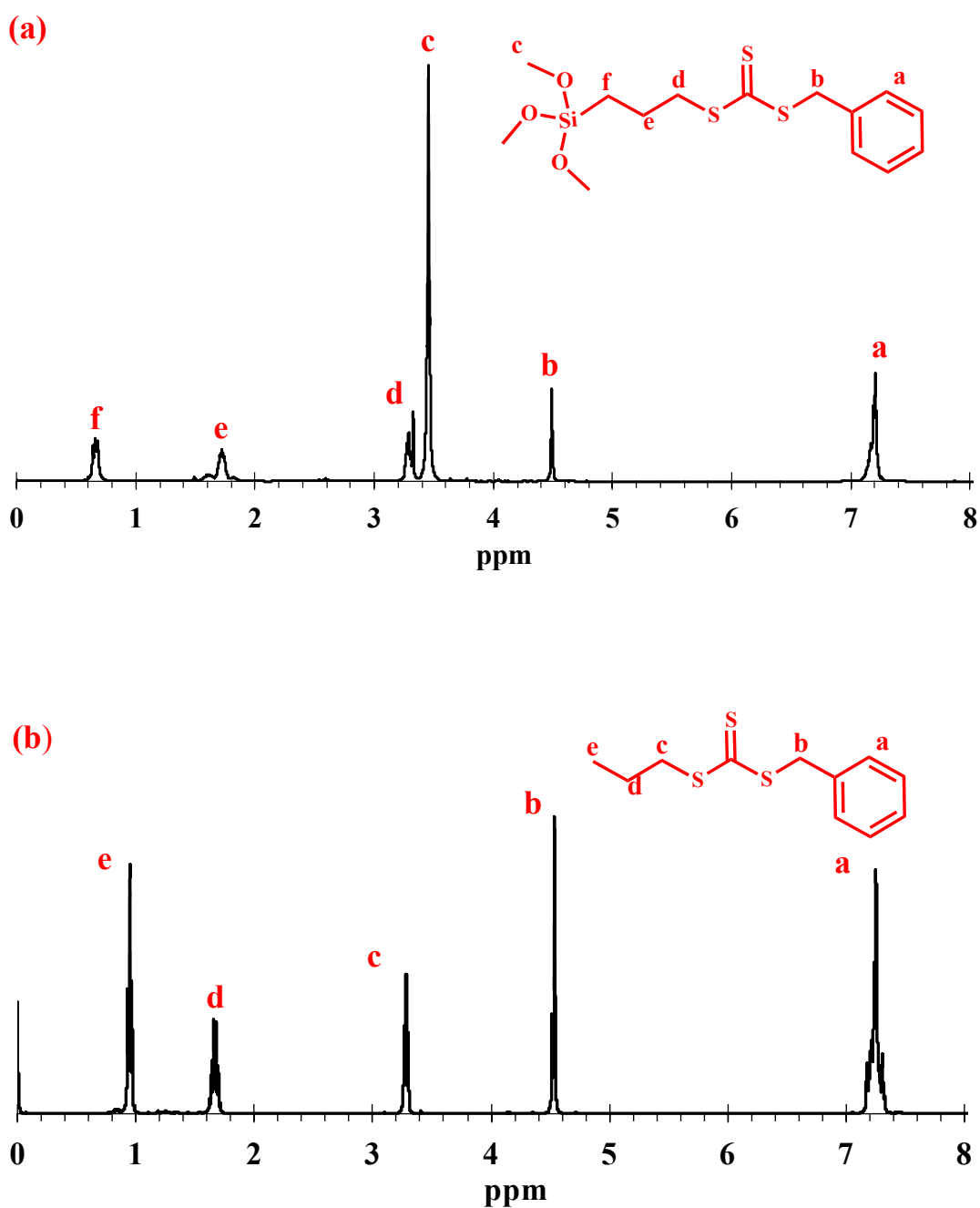


## Synthesis of mechanically reinforced silica aerogels *via* Surface-Initiated Reversible Addition-Fragmentation Chain Transfer (RAFT) Polymerization

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**Fig. S1** <sup>1</sup>H NMR spectra of a) *S*-Benzyl *S'*-trimethoxysilylpropyltrithiocarbonate (BTPT-silica), and b) *S*-benzyl *S'*-propyltrithiocarbonate (BPTT).

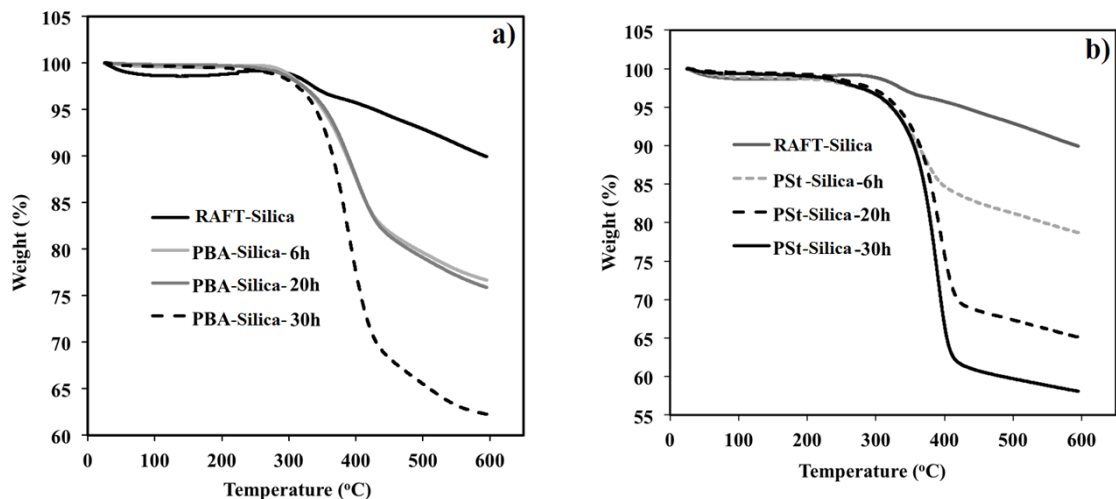


Fig. S2 TGA curves of a) PBA-silica aerogels and b) PSt-silica aerogels.

Table S1. Results of TGA and SEC analysis for RAFT graft polymerization.

Aerogel	$T_{\text{onset}}$ (°C)	Wt% polymer <sup>b</sup>	$G_r$ (%) <sup>c</sup>	$G_p$ ( $\mu\text{mol g}^{-1}$ ) <sup>d</sup>	Initiator efficiency <sup>e</sup> (%)
0 <sup>a</sup>	314	-	-	-	-
6h-PBA	336	21	0.16	0.24	1.4
20h-PBA	340	23	0.30	0.44	2.5
30h-PBA	350	36	0.46	0.50	2.9
6h-PSt	320	20	0.15	1.72	10.1
20h-PSt	357	34	0.41	3.20	19.0
30h-PSt	358	40	0.56	4.00	24.0

<sup>a</sup>Silica aerogel prepared without PBA/PSt (RAFT-Silica)

<sup>b</sup>Wt%: weight percent of PBA/PSt in PBA- and PSt-silica composites, estimated from TGA data ;

<sup>c</sup>Weight grafting ratio of polymeric chain on silica surface,

$$G_r = \frac{Wt\%_{\text{polymer-silica}}}{100 - Wt\%_{\text{polymer-silica}}} - \frac{Wt\%_{\text{CTA-silica}}}{100 - Wt\%_{\text{CTA-silica}}};$$

$$G_p = \frac{G_r}{M_n(g)};$$

<sup>d</sup>Molar grafting ratio of polymeric chain on silica surface,

<sup>e</sup>Initiator efficiency = no. grafted polymer chains/no. of initiation sites.