Supporting Information

Facile synthesis of silica nanoparticles grafted with quaternized linear, comblike and toothbrushlike copolymers

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Table S1 Dependence of molecular weight and polydispersity of free PSt, total weight grafting ratio (G_r), molar grafting ratio of PSt ($G_{p,PSt}$) and quaternization efficiency (QE) on reaction time during tandem graft reaction

t (h)	C%	$M_{n,th}$	$M_{n,GPC}$	PDI	$M_{n,NMR}$	G_r (%)	$G_{p,PSt}$ (μmol g^{-1})	QE (%)
4	2.8	840	1180	1.43	1220	19.8	32.0	2.50
8	7.2	1520	1600	1.38	1650	24.6	52.7	4.58
12	11.6	2210	2330	1.20	2300	32.2	70.9	6.40
16	16.1	2920	2980	1.16	3060	40.4	80.1	7.33
20	19.5	3450	3520	1.15	3580	44.7	80.4	7.36
24	23.0	3990	3930	1.14	4140	49.2	80.4	7.36
30	28.3	4820	4980	1.13	5050	56.4	80.2	7.34

Reaction conditions: $[St]_0:[BBCP]_0:[AIBN]_0$ = 150:1:0.2, $[BBCP]_0:[DMA\ unit]_0$ = 2, $[M]_0$ = 2.0 mol L^{-1}, in DMF at 60 °C for different times.

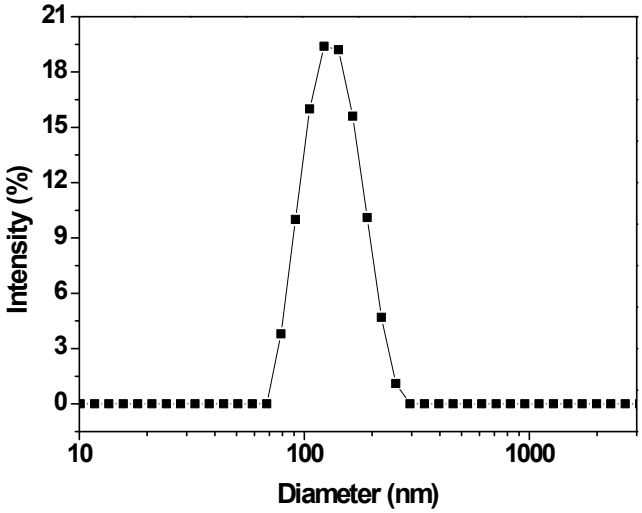

Fig. S1 DLS plots of silica nanoparticles dispersed in ethanol (D_h = 128 nm, PD = 0.083).

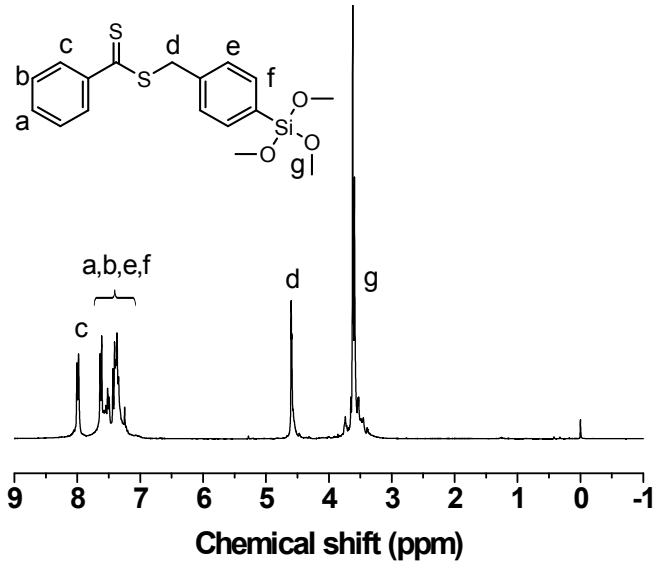

Fig. S2 ^{1}H NMR spectrum of TBDB.

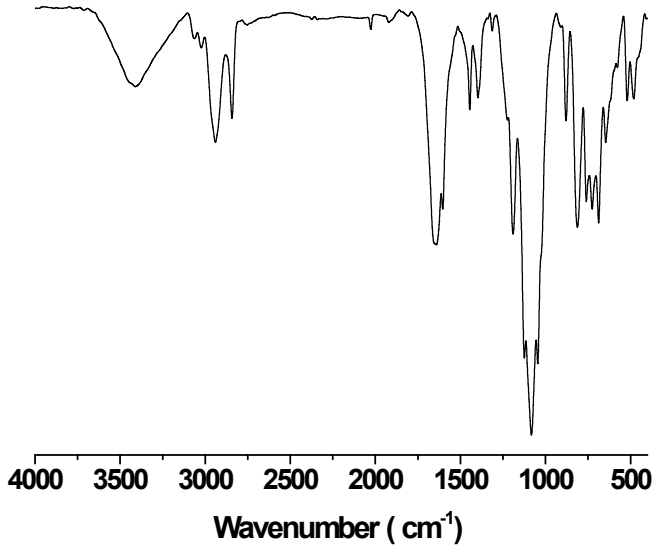

Fig. S3 IR spectrum of TBDB.

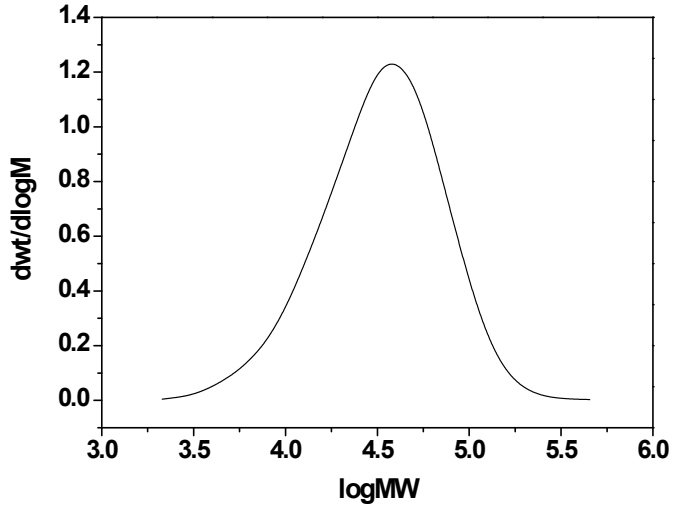

Fig. S4 GPC trace of free PDMA ($M_{n,GPC}$ = 24400, PDI = 1.75).

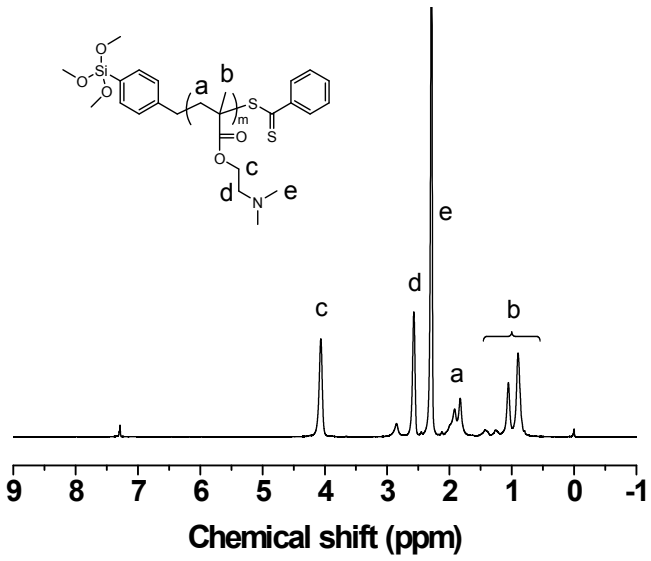

Fig. S5 ^{1}H NMR spectrum of PDMA produced in solution.

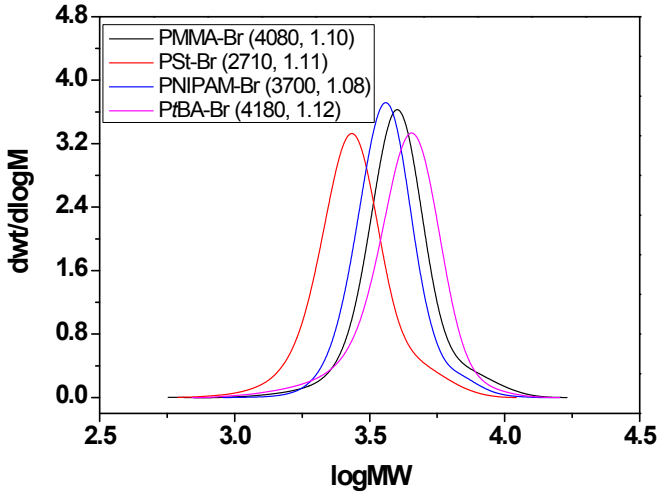

Fig. S6 GPC traces of as-prepared PM-Br samples used for graft reaction via "grafting to" approach.

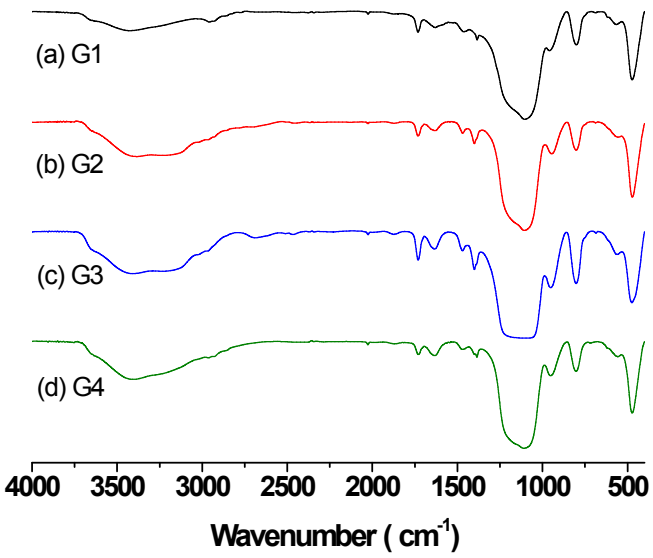

Fig. S7 IR spectra of PDMA grafted silica (G1) and SiO_2-*g*-(PDMA-*g*-RBr) (G2-G4).

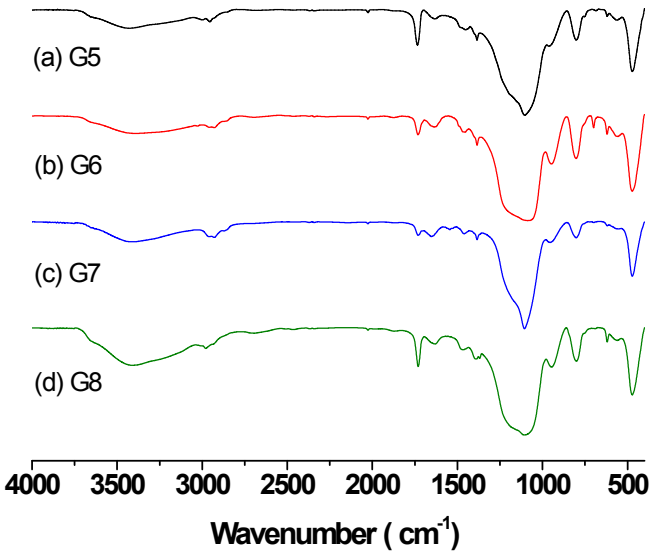

Fig. S8 IR spectra of SiO_2-*g*-(PDMA-*g*-PM) (G5-G8).

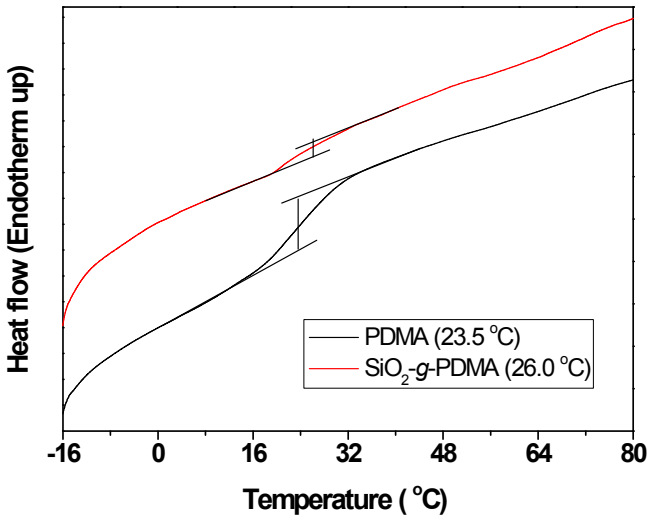

Fig. S9 DSC curves of free PDMA and SiO_2-*g*-PDMA.