Supporting Information

Synthesis of Well-defined Functionalized Poly(2-(Diisopropylamino)ethyl Methacrylate) Using ATRP with Sodium Dithionite as a SARA Agent

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Results

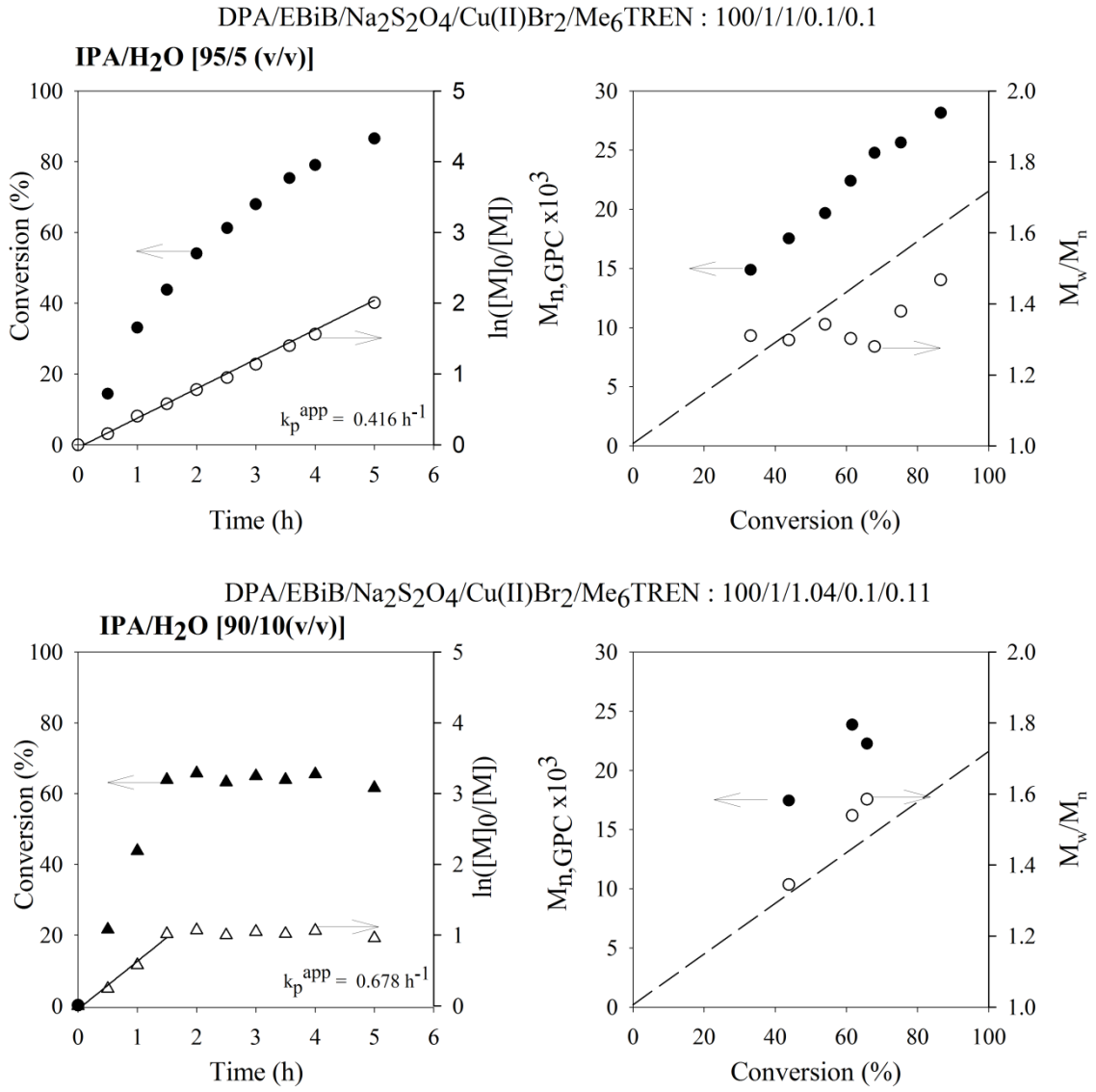

Fig. S1 Kinetic plots of DPA conversion and $\ln[M]_0/[M]$ vs time and the plot of number average MW ($M_{n,GPC}$) and dispersity (M_w/M_n) vs conversion for ATRP of DPA in the presence of $Cu(II)Br_2/Me_6TREN$ with $Na_2S_2O_4$ in two different IPA/water mixtures. Conditions: $[DPA]_0$/solvent = 1/2 (v/v), $[IPA]/[H_2O]$ = 0.95/0.05 (v/v) or 0.90/0.10 (v/v); $[DPA]_0$ /$[EBiB]_0$ /$[Na_2S_2O_4]_0$ /$[CuBr_2]_0$ /$[Me_6TREN]_0$ = 100/1/1/0.1/0.1 (molar); T= 40 °C.

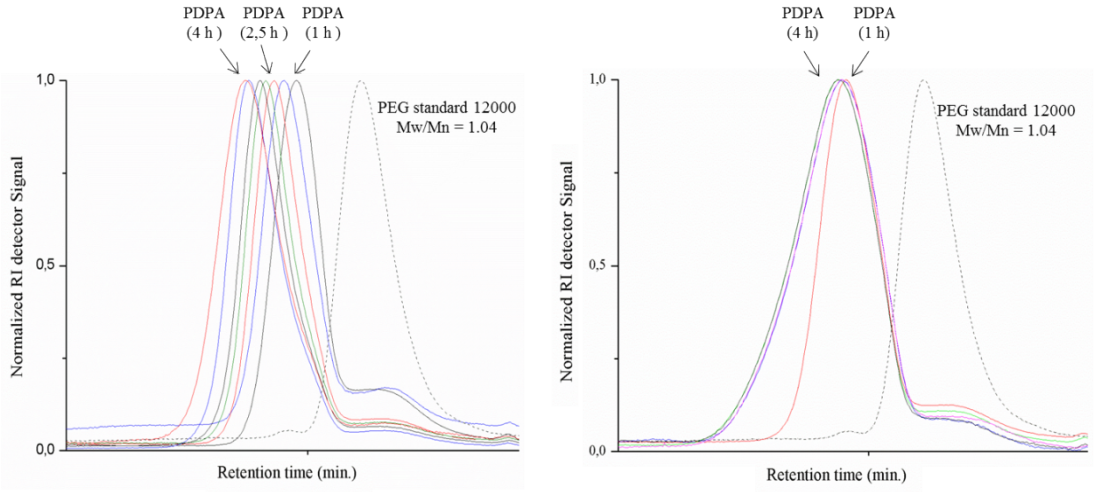

Fig. S2 GPC traces of PEG standard (Mp = 12 000 $gmol^{-1}$; Mw/Mn = 1.04) and PDPA samples. Conditions: (left) $[DPA]_0$/solvent = 1/2 (v/v), [IPA]/$[H_2O]$ = 0.95/0.05 (v/v); $[DPA]_0$ /$[EBiB]_0$ /$[Na_2S_2O_4]_0$ /$[CuBr_2]_0$ /$[Me_6TREN]_0$ = 100/1/1/0.1/0.1 (molar); T= 40ºC; (right) $[DPA]_0$/solvent = 1/2 (v/v), [IPA]/$[H_2O]$ = 0.90/0.10 (v/v), $[DPA]_0$ /$[EBiB]_0$ /$[Na_2S_2O_4]_0$ /$[CuBr_2]_0$ /$[Me_6TREN]_0$ = 100/1/1 /0.1/0.1 (molar); T= 40 ºC.

Table S1: Details for the various kinetic points in the polymerization of DPA. Conditions $[DPA]_0$/solvent = 1/2 (v/v), [IPA]/$[H_2O]$ = 0.95/0.05 (v/v); $[DPA]_0$ /$[EBiB]_0$ /$[Na_2S_2O_4]_0$ /$[CuBr_2]_0$ /$[Me_6TREN]_0$ = 50/1/1/0.1/0.1 (molar); T= 40ºC.

Kinetic point (h)	Conv. (%)	$M_{n,th}$ x10^3	$M_{n,GPC}$ x10^3	M_w/M_w	**GPCmain trace**			**GPC minor trace**		
					$M_{n,GPC}$ x10^3	M_w/M_w	%	$M_{n,GPC}$ x10^3	M_w/M_w	%
1	29	3.31	10.12	1.99	16.91	1.03	58.2	8.01	1.09	41.8
2	47	5.15	12.27	1.23	19.72	1.05	82.9	8.06	1.08	17.1
2.5	58	6.38	15.48	1.19	19.77	1.05	87.6	7.73	1.07	12.4
3	67	7.35	16.61	1.18	20.97	1.04	89.5	8.08	1.09	10.5
4	78	8.48	17.99	1.19	22.43	1.04	91.9	8.19	1.10	8.1
5	88	9.57	20.16	1.14	23.60	1.04	93.4	8.84	1.08	6.6

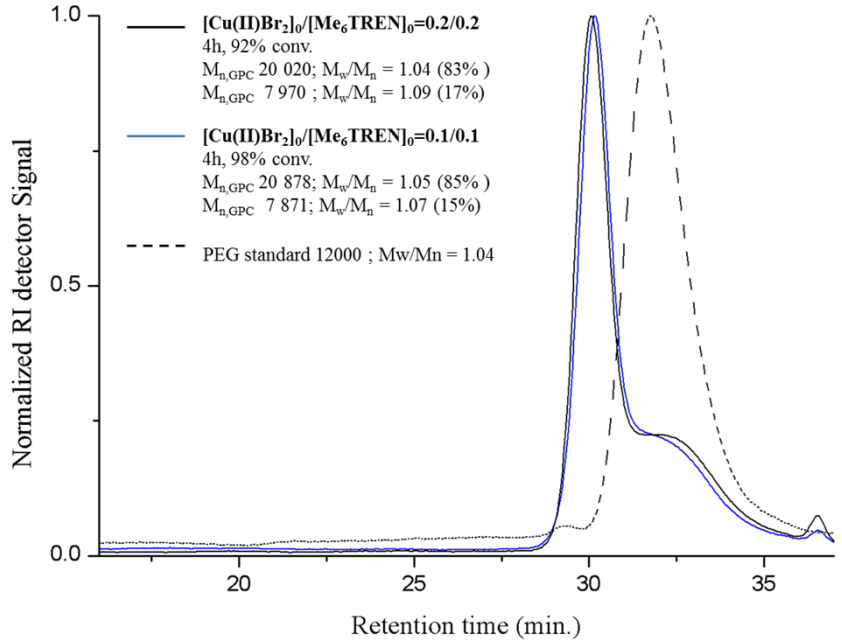

Fig. S3 GPC traces of PEG standard (Mp = 12 000 gmol^{-1}; Mw/Mn = 1.04) and PDPA samples for two synthesized using two different concentrations of copper complex (0.1 and 0.2). Conditions: $[DPA]_0$/solvent = 1/2 (v/v), [IPA]/[H_2O] = 0.95/0.05 (v/v); $[DPA]_0$ /$[EBiB]_0$ /$[Na_2S_2O_4]_0$ /$[CuBr_2]_0$ /$[Me_6TREN]_0$ = 20/1/1/0.1/0.1 (molar) and 20/1/1/0.2/0.2; T= 40ºC.

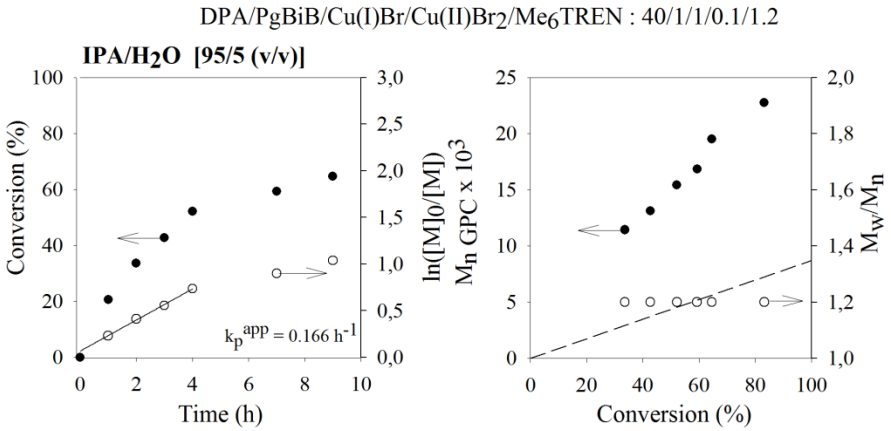

Fig. S4 Kinetic plot of DPA conversion and ln$[M]_0/[M]$ vs time and the plot of number average MW ($M_{n,GPC}$) and dispersity (M_w/M_n) vs conversion for ATRP of DPA in the presence of Cu(II)Br_2/Me_6TREN with Cu(I)Br . Conditions: $[DPA]_0$/solvent = 1/2 (v/v), [IPA]/[H_2O] = 0.95/0.05 (v/v); $[DPA]_0$ /$[PgBiB]_0$ /$[CuBr]_0$ /$[CuBr_2]_0$ /$[Me_6TREN]_0$ = 40/1/1/0.1/1.2 (molar); T= 40 °C.