SUPPORTING INFORMATION

Biomimetic and Hydrophilic Vitamin B5 Analogous Methacrylamide Polymers Prevent Surface Fouling

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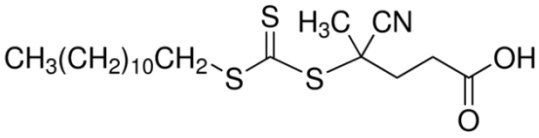
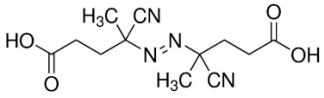
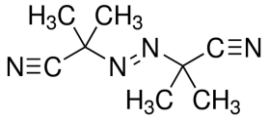
Table S1. Three CTAs (CDSPA, CPAB and CTCPA) and four initiators (ACVA, AIBN, AMPA and VA-0044) were used to optimize the parameters for the polymerization of B5AMA by RAFT approach. For all the reactions the monomer concentration was 1M and the reaction time was 24 hours.

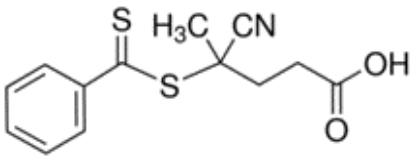
MeOH= Methanol; Ac. Buffer= Acetate Buffer (1M, pH= 5.5); DMAc= Dimethylacetamide; DMF= Dimethylformamide; DMSO= Dimethyl sulfoxide; ETOH= Ethanol.



4-Cyano-4-[(dodecylsulfanylthiocarbonyl)sulfanyl]pentanoic acid (CDSPA)

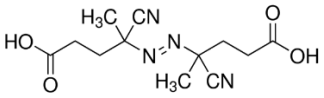
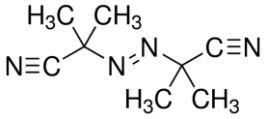
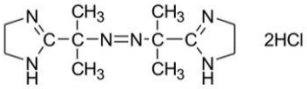
[870196-80-8]

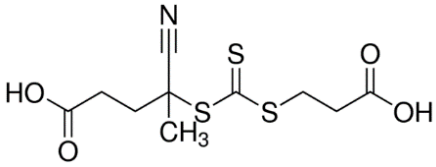
INITIATOR	SOLVENT	T, °C	[CTA]/[INI]	$Mw_{expec.}$, Da	Mw_{GPC}, Da	PDI
 ACVA	MeOH:Ac. Buffer, 1:1	70	3	15100	12024	1.61
	MeOH:Ac. Buffer, 1:1	70	5	15100	N.R.	N.R.
	MeOH:Ac. Buffer, 1:1	70	10	15100	N.R.	N.R.
	Dioxane: Ac. Buffer, 1:1	70	3	15100	6862	1.53
	DMAc: Ac. Buffer, 1:1	70	3	15100	N.R.	N.R.
 AIBN	DMF	70	3	15100	4987	1.51
	MeOH:Ac. Buffer, 1:1	70	5	15100	N.R.	N.R.
	DMA	70	3	15100	N.R.	N.R.
	Dioxane	70	3	15100	21592	2.15
	Dioxane	70	6	15100	22289	2.39
	Dioxane:H_2O, 9:1	70	6	15100	5400	1.45
	DMF	70	6	15100	N.R.	N.R.
	DMSO	70	6	15100	N.R.	N.R.



4- Cyanopentanoic acid dithiobenzoate (CPAB)

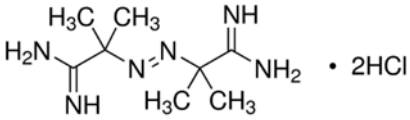
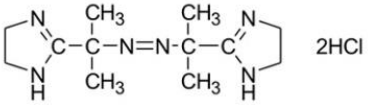
[201611-92-9]

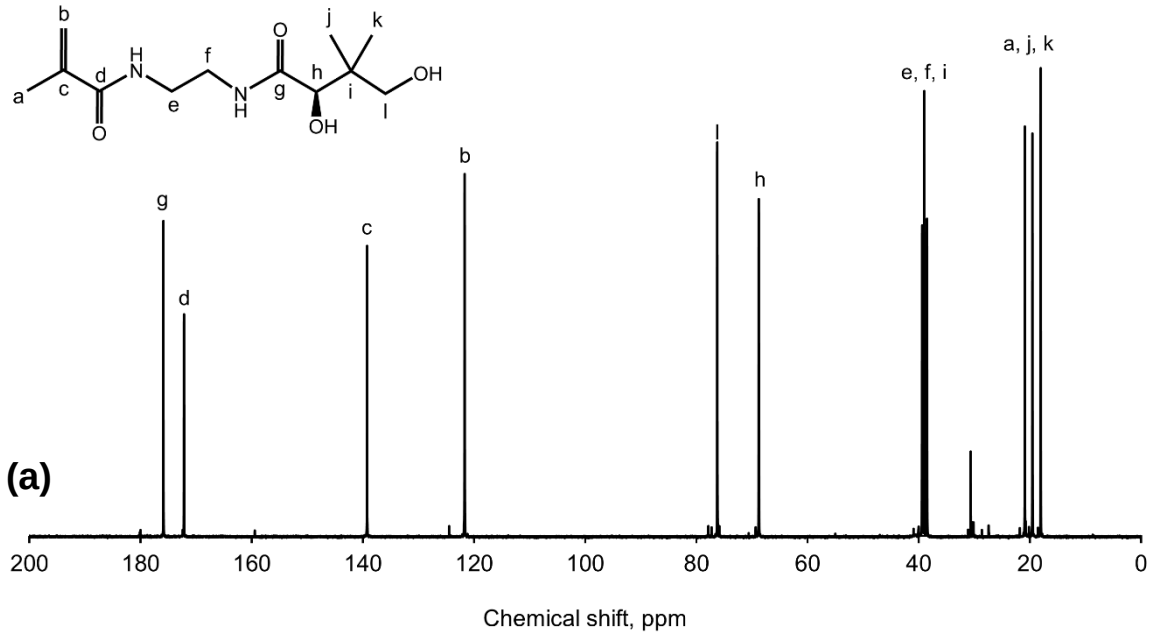
INITIATOR	SOLVENT	T, °C	[CTA]/[INI]	$Mw_{expec.}$, Da	Mw_{GPC}, Da	PDI
 ACVA	$NaHCO_3$, 0.1M	70	2	26100	N.R.	N.R.
	EtOH:H_2O, 15:85	70	2	26100	24255	2.12
	EtOH:Ac. Buffer, 1:4	70	2	26100	4581	1.38
	EtOH:Ac. Buffer, 1:4	70	5	15100	N.R.	N.R.
	H_2O:Dioxane, 1:1	70	3	15100	9021	1.33
 AIBN	MeOH	70	2	15100	N.R.	N.R.
	MeOH	70	3	15100	N.R.	N.R.
	MeOH	70	4	15100	N.R.	N.R.
 VA-044	Ethanol	50	3	15100	N.R.	N.R.
	DMF:H_2O, 1:1	50	3	15100	N.R.	N.R.

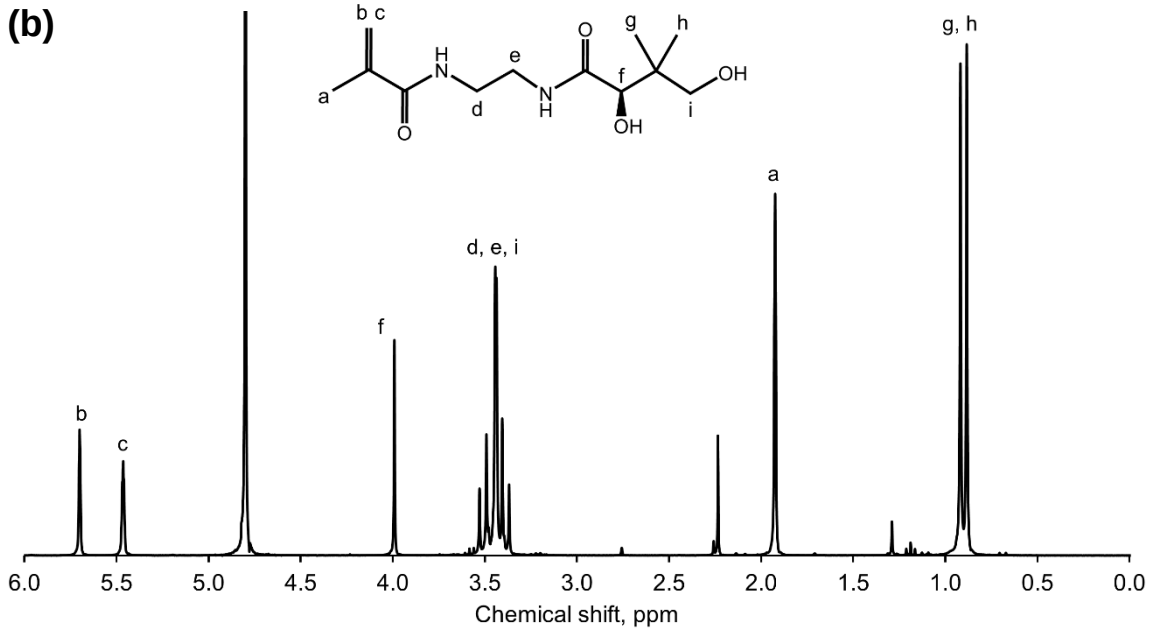


4-((((2-Carboxyethyl)thio)carbonothioyl) thio)-4-cyanopentanoic acid (CTCPA)

[2055041-03-5]

INITIATOR	**SOLVENT**	**T, °C**	**[CTA]/[INI]**	**$Mw_{expec.}$, Da**	**Mw_{GPC}, Da**	**PDI**
 AMPA	Ac. Buffer	50	3	15100	N.R.	N.R.
 VA-044	Ac. Buffer	50	3	5000	5162	1.22
	Ac. Buffer	50	3	15100	14526	1.20
	MeOH:H_2O, 10:1	50	3	15100	14257	1.14


(a)
a, j, k
e, f, i
l
b
h
g
c
d
200
180
160
140
120
100
80
60
40
20
0
Chemical shift, ppm


(b)
g, h
a
d, e, i
f
b
c
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
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Chemical shift, ppm

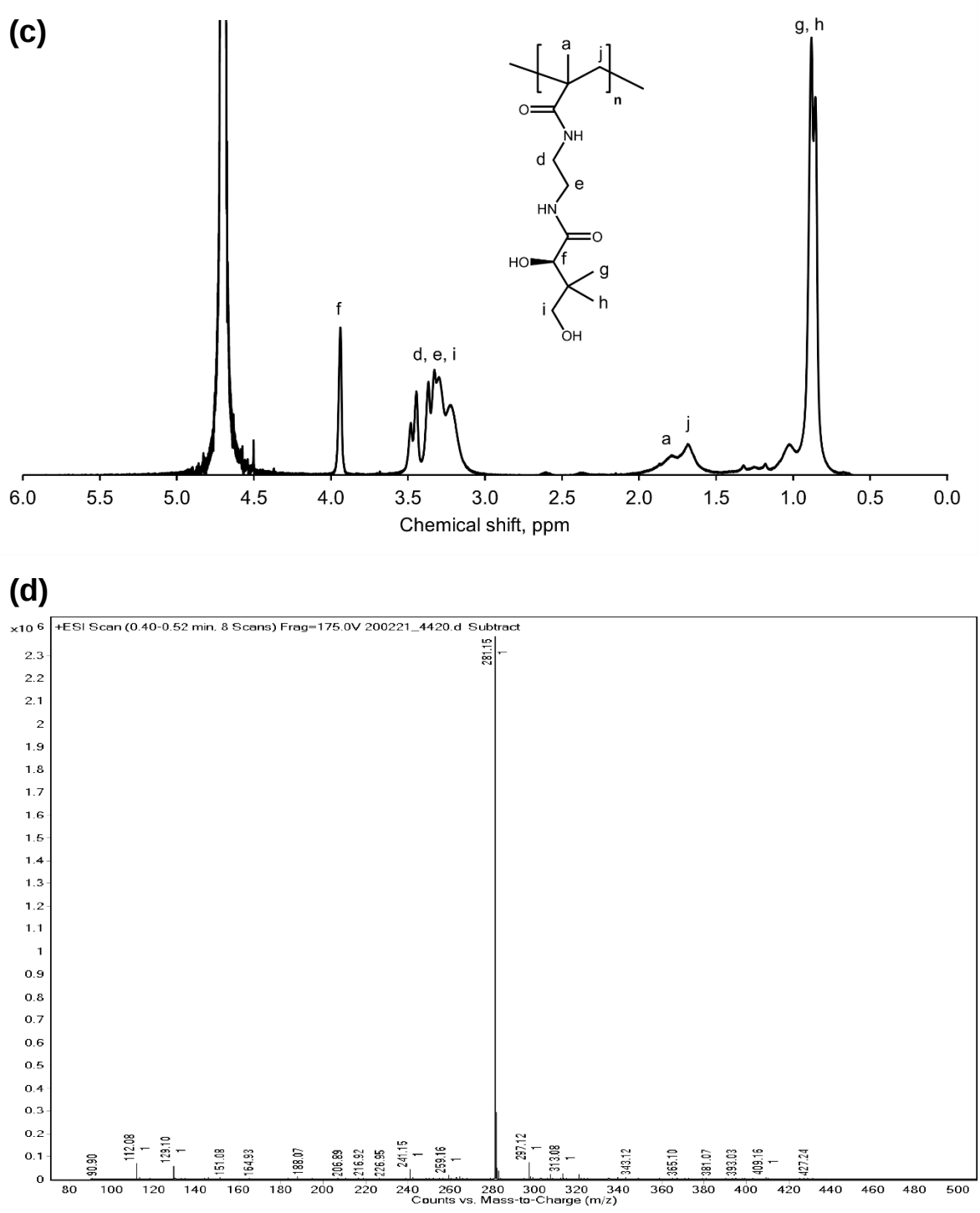


Figure S1. (a) ^{13}C NMR spectra of B5AMA monomer, (b) ^{1}H NMR spectra of B5AMA monomer, (c) ^{1}H NMR spectra of poly(B5AMA), and (d) mass spectra of B5AMA monomer.

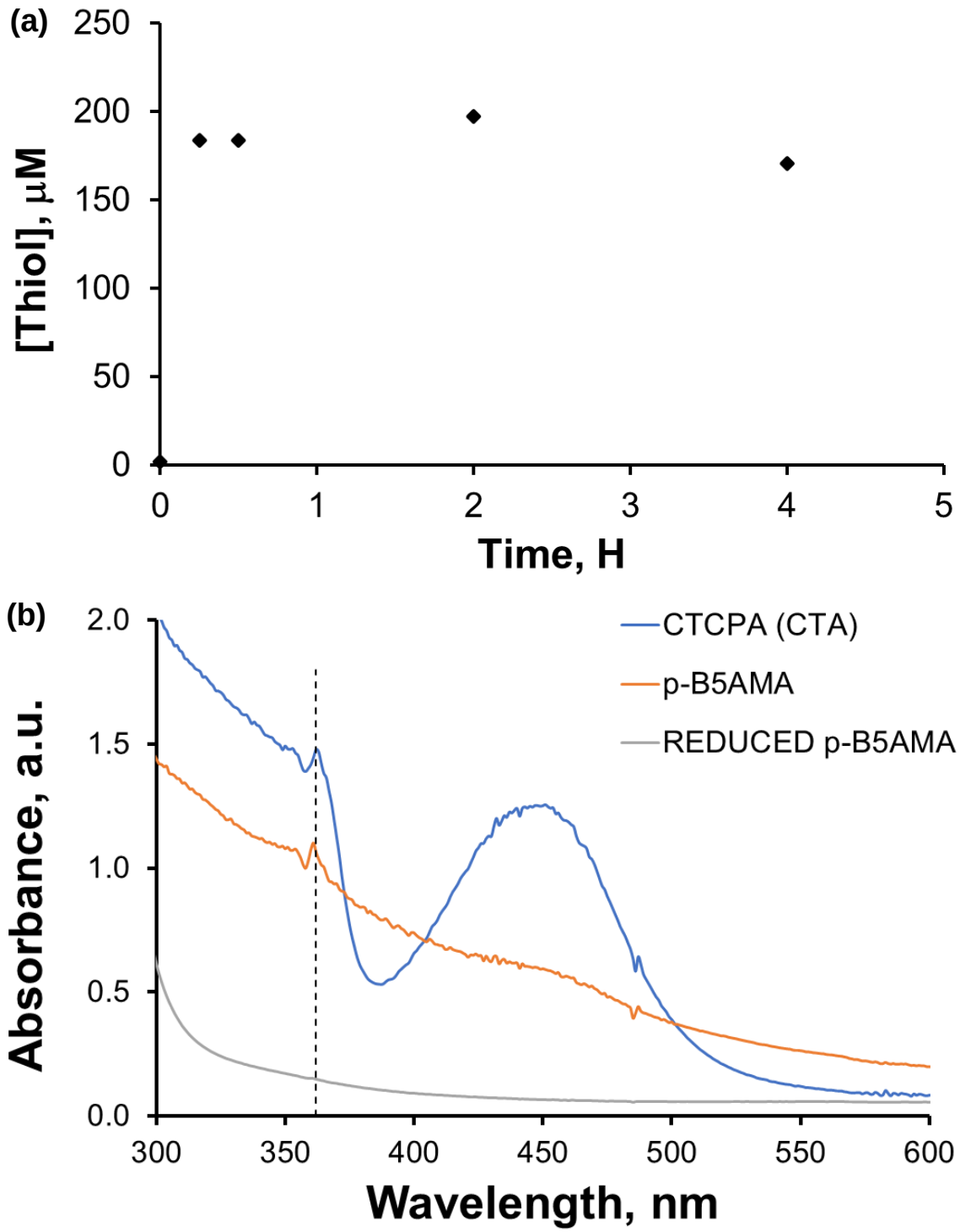


Figure S2. (a) Kinetics of the trithiocarbonate end group hydrolysis in $NaBH_4$ solution

followed by treatment with Ellman´s reagent. (b) UV-vis spectrum of poly(B5AMA) before and after the cleavage of the trithiocarbonate end group showing the disappearance of the absorbance band at 360 nm ascribed to π-π* transition of the thiocarbonyl bond.

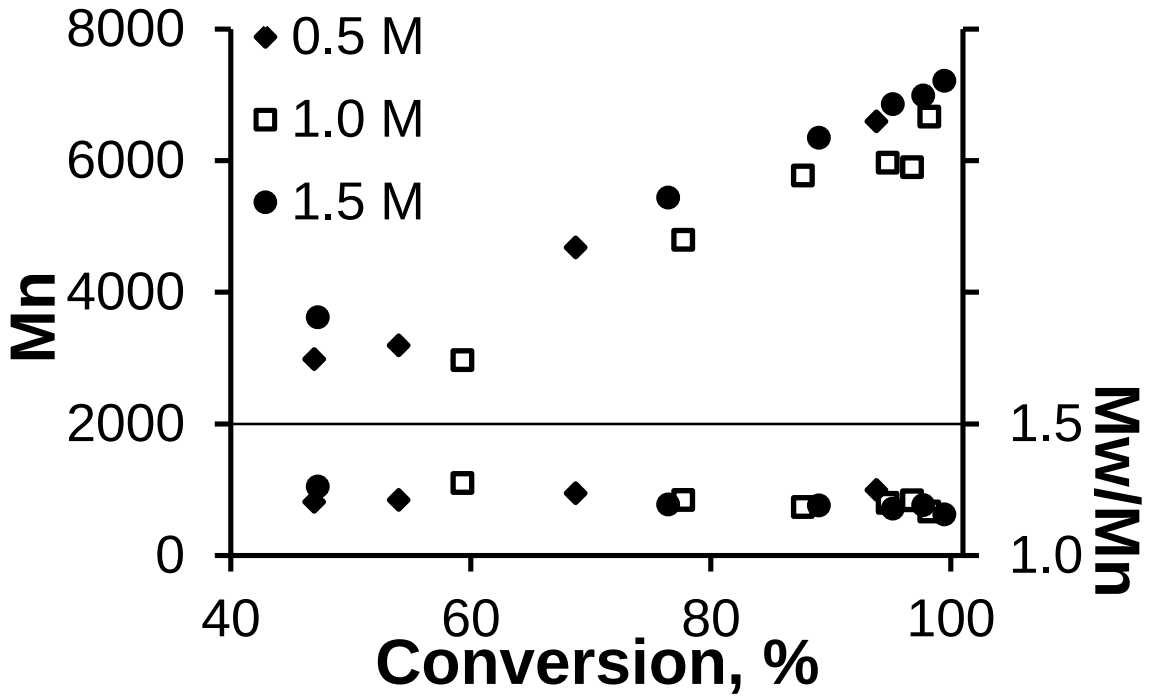


Figure S3. Number-average molecular weights (M_n) and polydispersity indices (M_w/M_n) of poly(B5AMA)$_{30}$, as a function of B5AMA conversion and at different initial concentrations of the monomer.

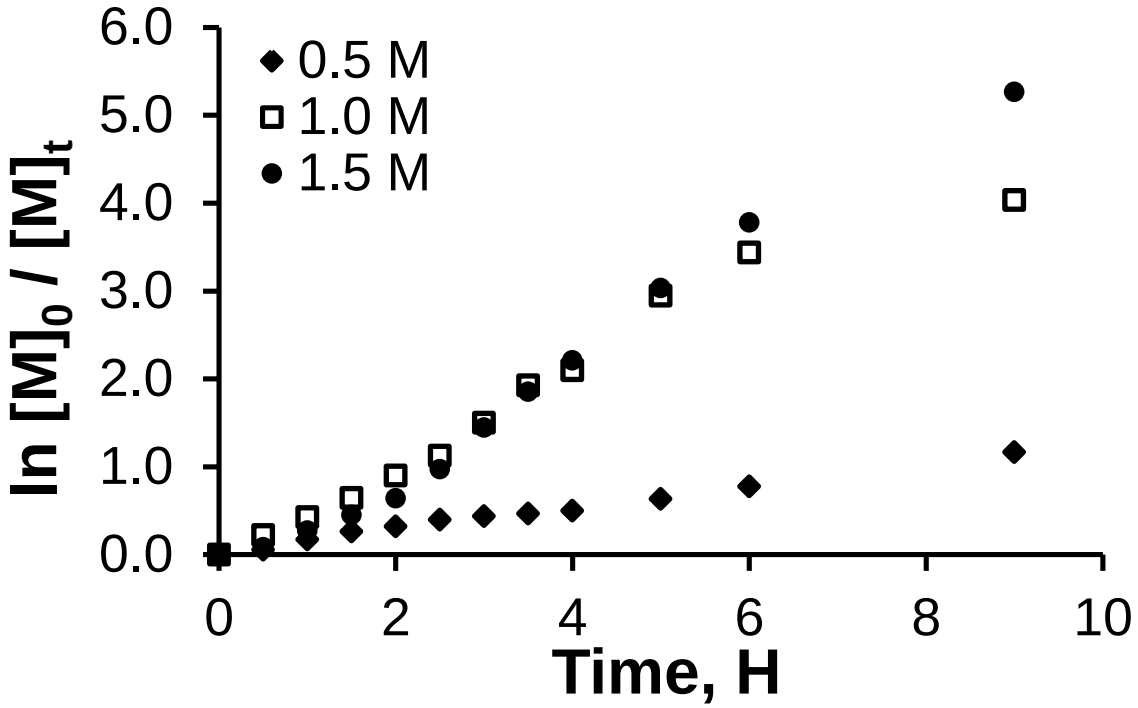


Figure S4. Semi-logarithmic kinetic curves for RAFT polymerization of poly(B5AMA)$_{30}$ performed in methanol:water (1:10 v/v) at 50 °C, using CTCPA as the chain transfer agent and VA-044 as the initiator. The reaction was performed at [CTA]/[INI]=3, with different initial concentrations of the monomer.

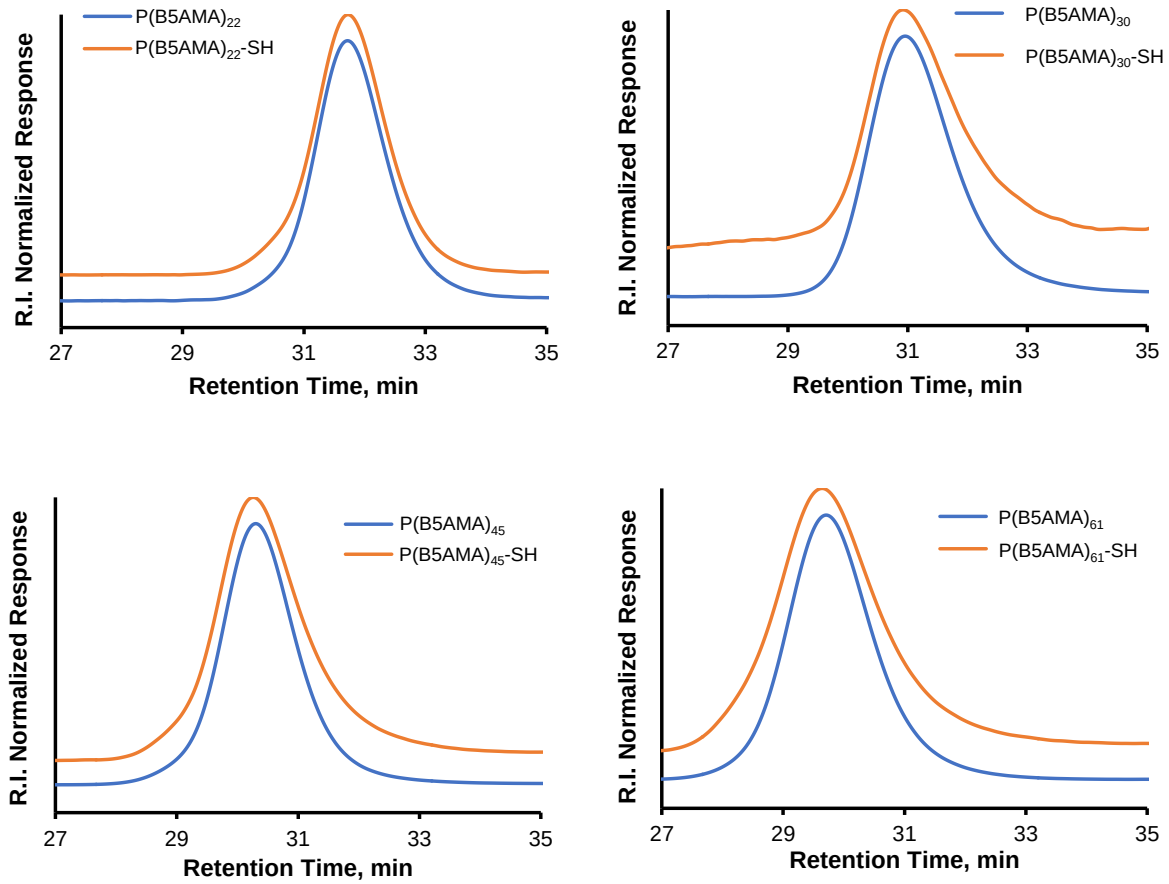


Figure S5. GPC traces of poly(B5AMA) before (blue trace), and after reduction with $NaBH_4$ (orange trace).

Table S2. Molecular weights and polydispersities of poly(B5AMA) before and after reduction and purification.

	Before Reduction		After Reduction and Dialysis	
Polymer sample	Mw_{GPC}, Da	PDI	Mw_{GPC}, Da	PDI
$P(B5AMA)_{22}$	5734	1.14	5862	1.14
$P(B5AMA)_{30}$	8037	1.21	7867	1.35
$P(B5AMA)_{45}$	12055	1.16	11565	1.34
$P(B5AMA)_{61}$	16529	1.21	16716	1.45

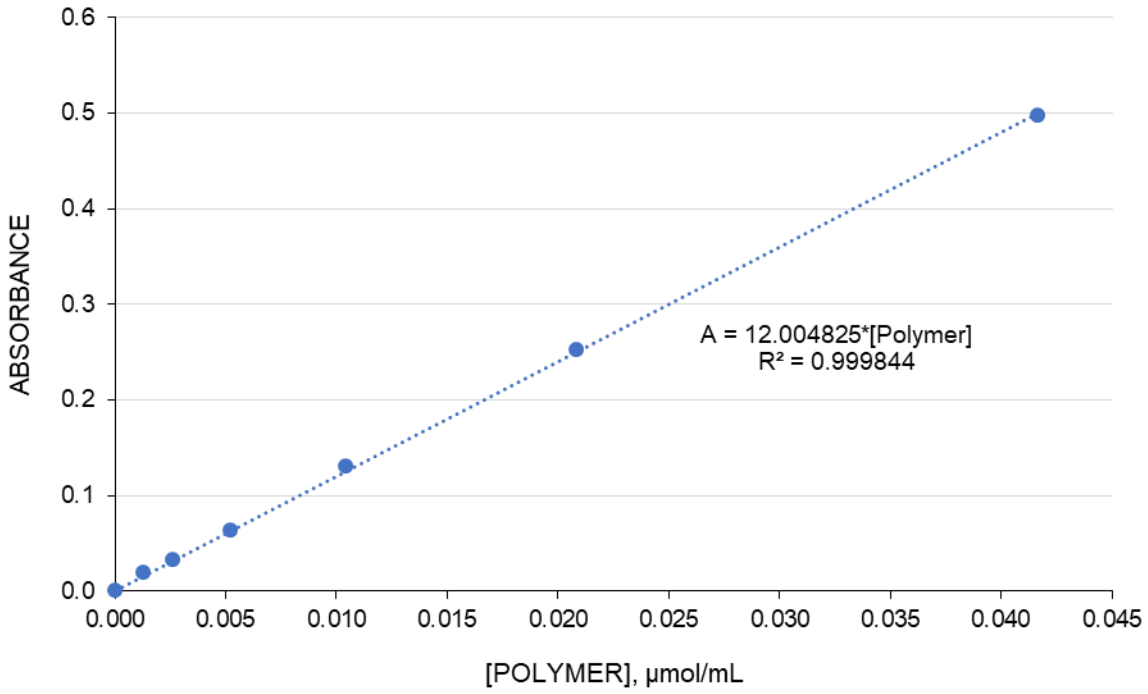


Figure S6. The calibration curve for the polymeric thiol prepared by the reaction of poly(B5AMA)$_{45}$-SH with DTNB (Ellman's reagent). The absorbance was recorded at 412 nm.

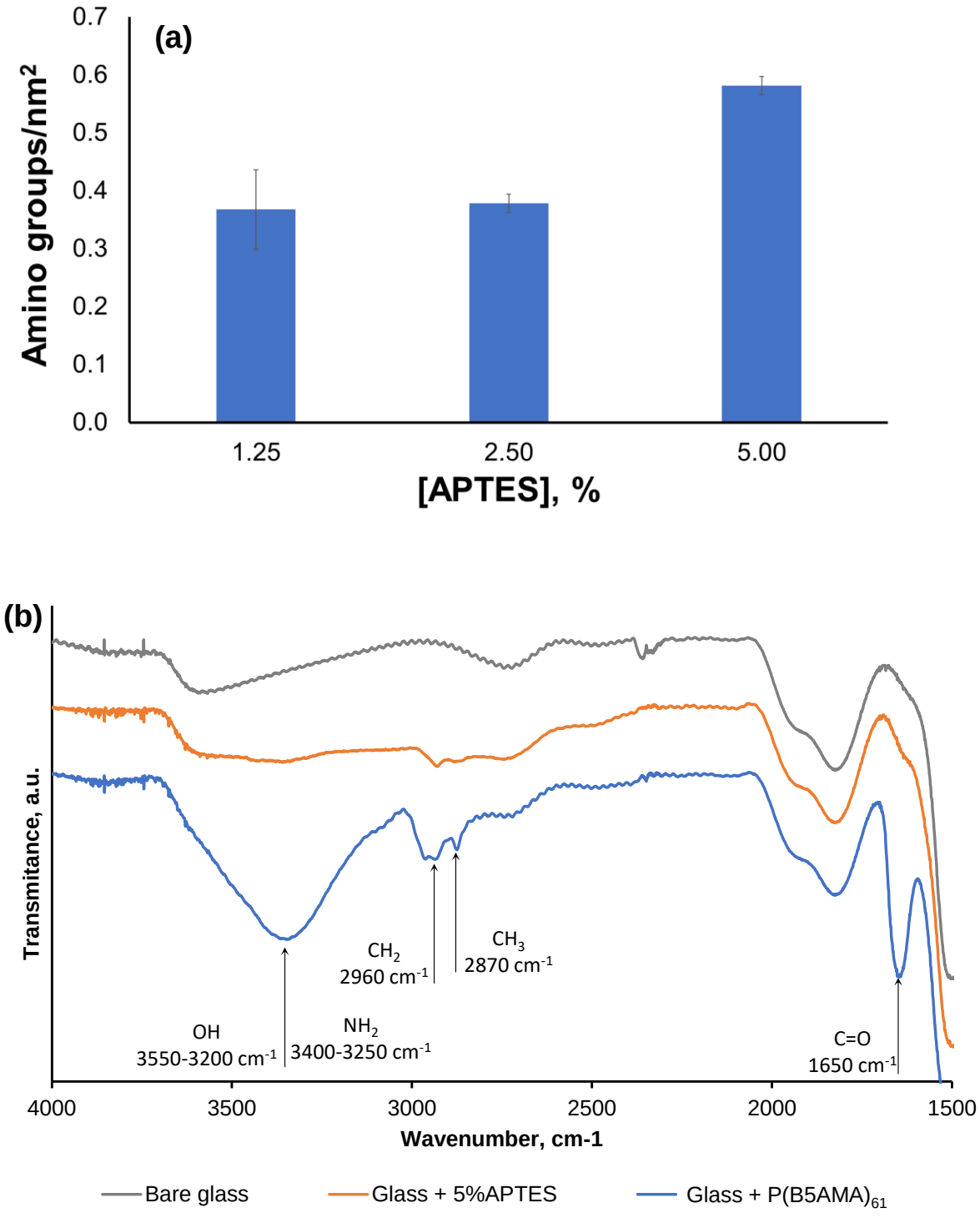


Figure S7. Characterization of glass surfaces before and after the functionalization process. (a) Surface amino group coverage after the functionalization with different concentrations

of APTES. (b) FTIR spectrum of the glass slides functionalized with APTES (orange line) and poly(B5AMA) (blue line).

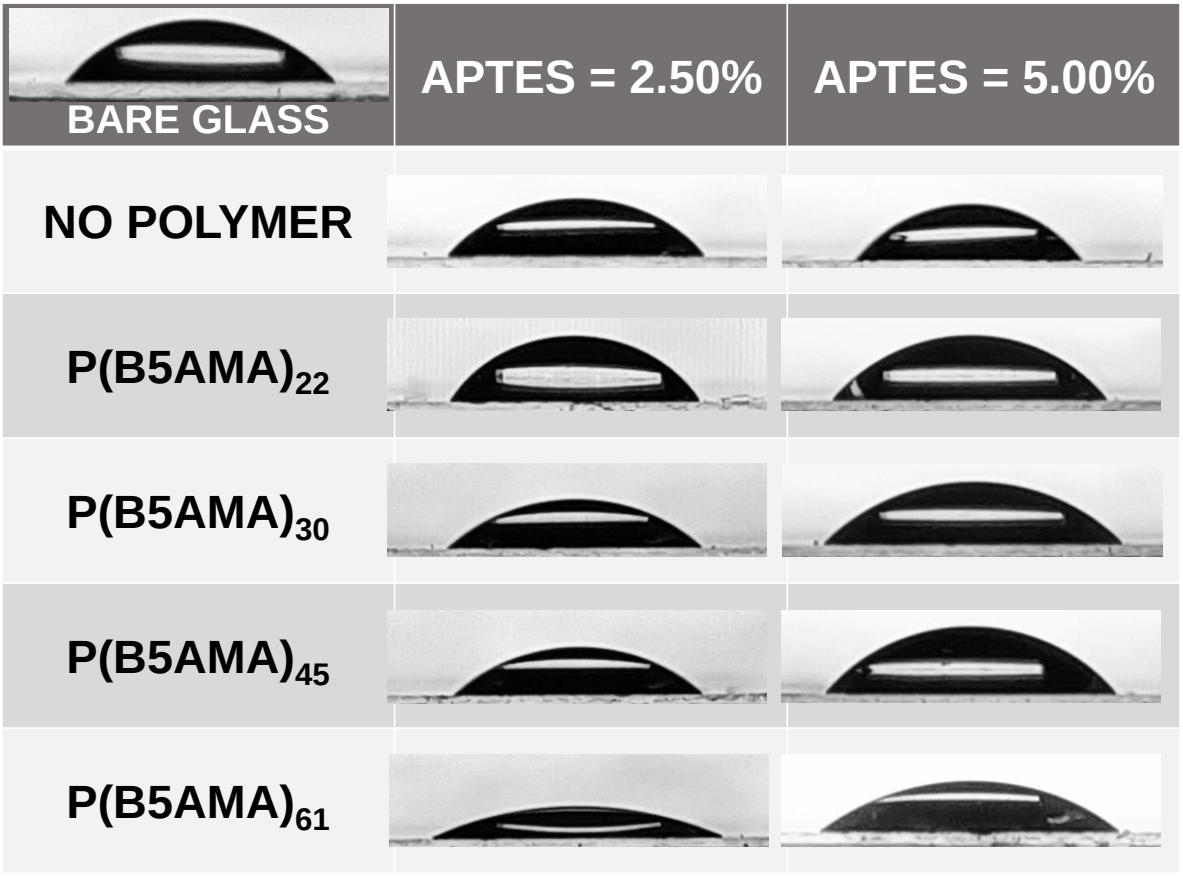


Figure S8. Photographs of water contact angle on 2.5Am- and 5Am-p(B5AMA) modified glass surfaces.

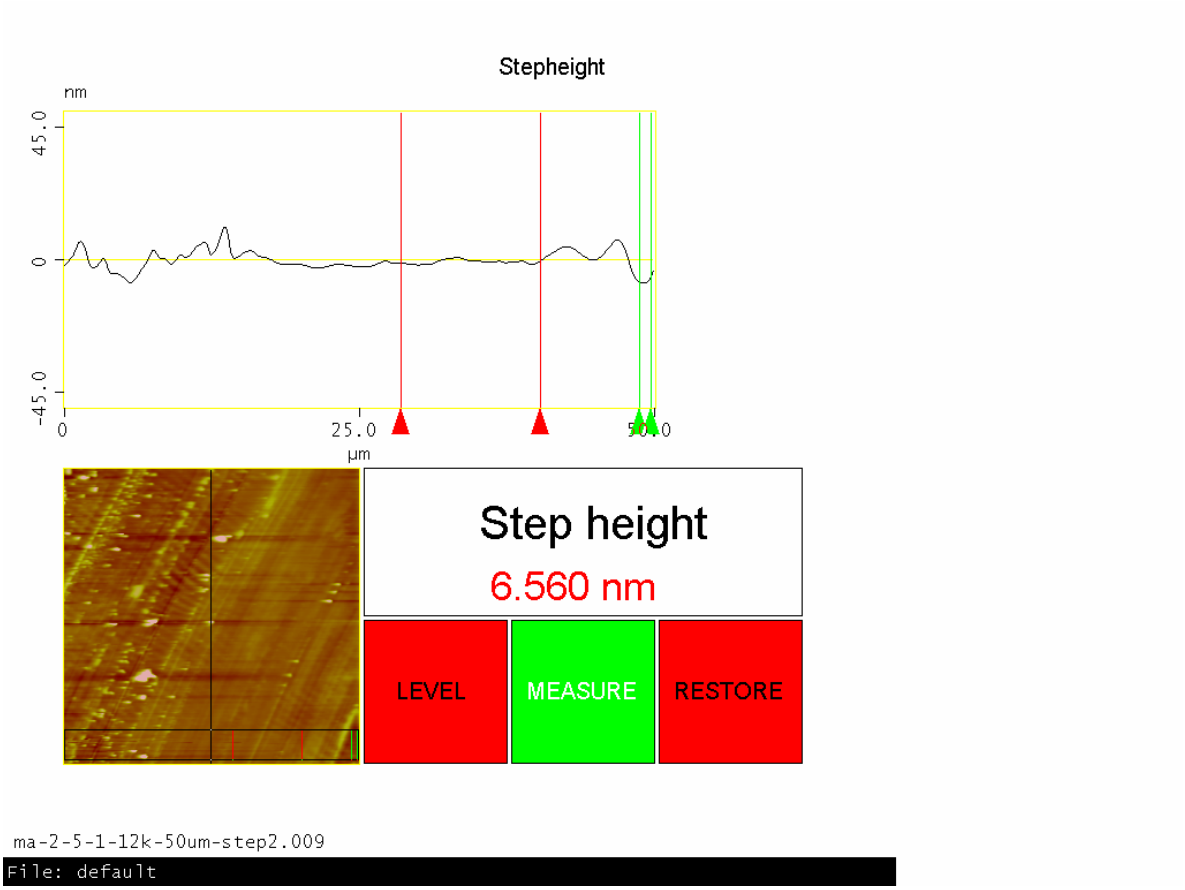


Figure S9. Measurement of polymer layer thickness by AFM analysis for 2.5Am-p(B5AMA)$_{30}$.

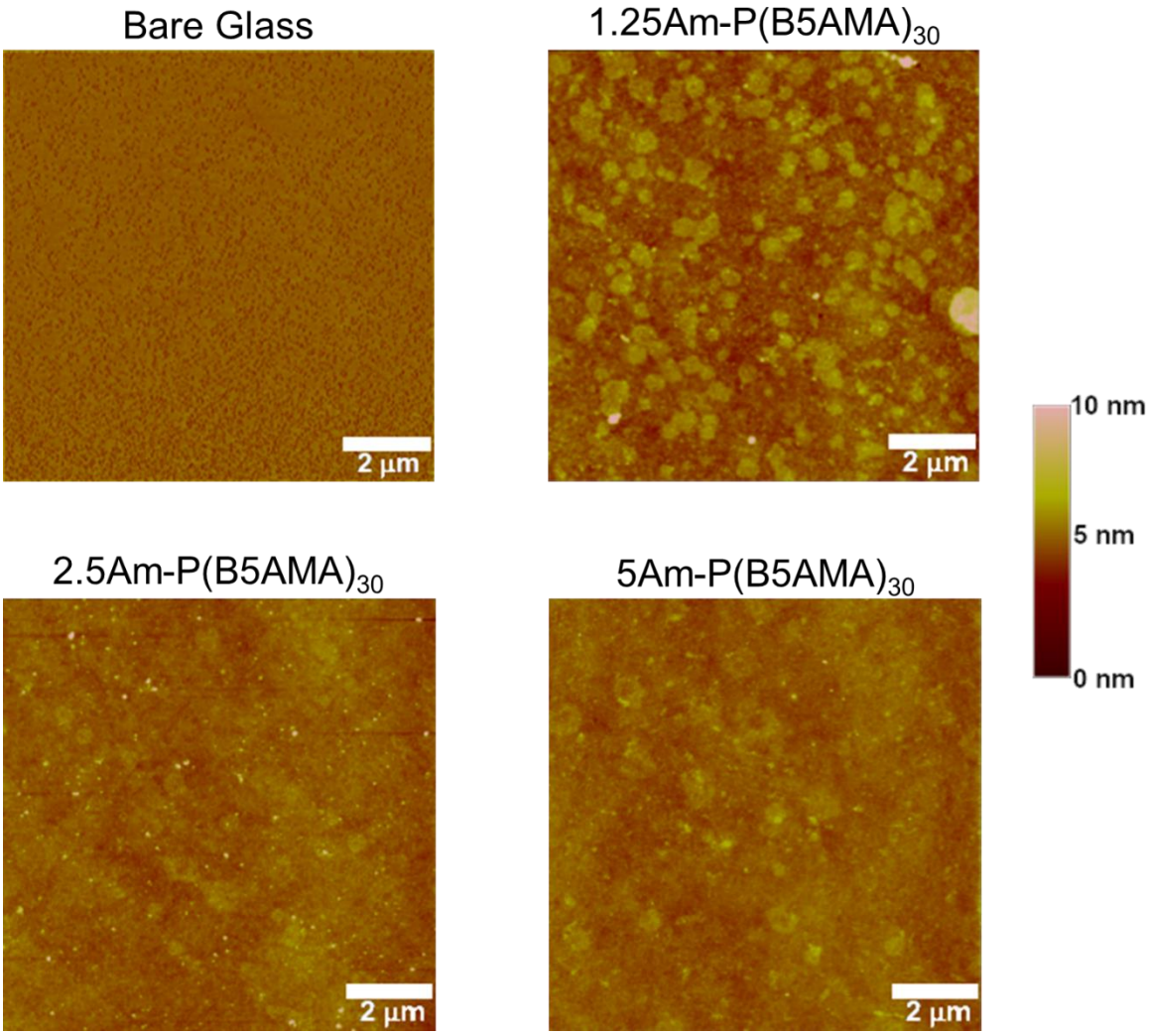
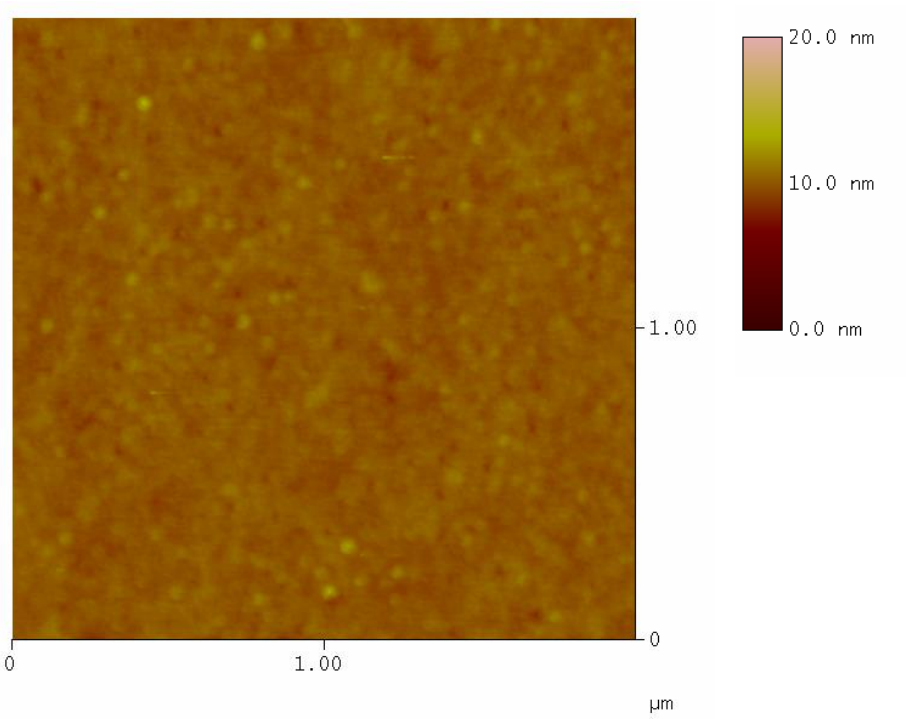


Figure S10. AFM images of polymer grafted glass slides.



Sample	Mean Roughness (Rq) 2 µm x 2 µm
2.5Am-p(B5AMA)$_{45}$	0.37 nm

Figure S11. Morphology and mean square roughness of 2.5Am-p(B5AMA)$_{45}$ glass slides, as analyzed by AFM.

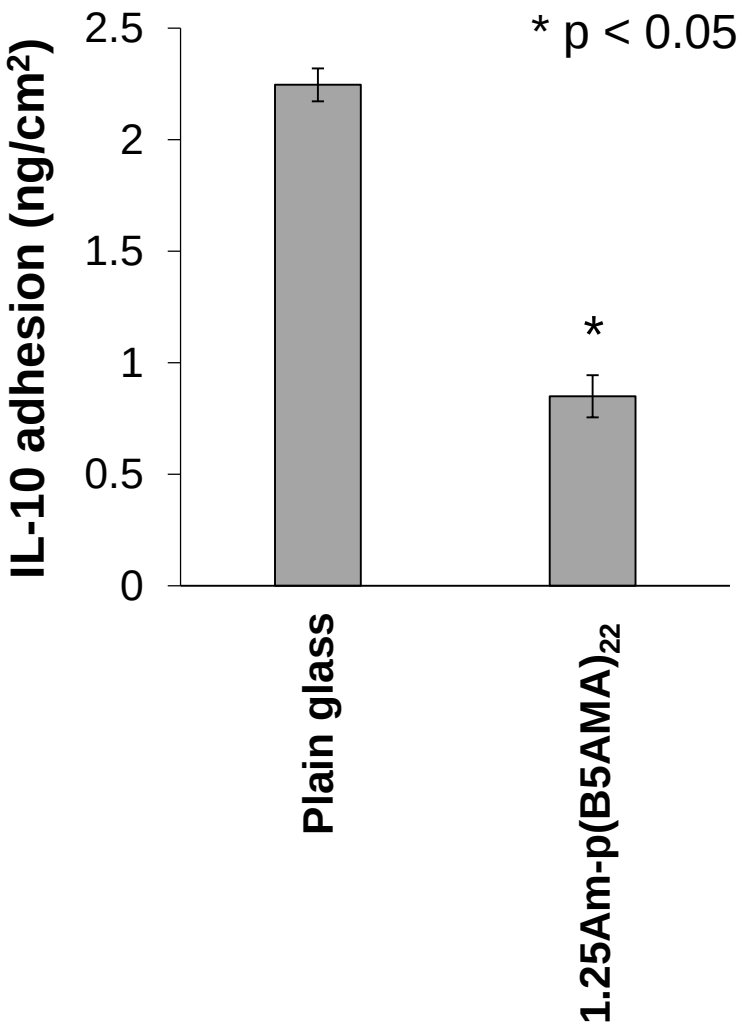


Figure S12. Adhesion of IL-10 cytokine on bare and polymer functionalized glass surface, as was measured by ELISA assay. Error bars correspond to standard deviations of data from three independent measurements. The asterisk (*) indicate that the data obtained for polymer functionalized glass surfaces is significantly different than bare glass reference.