Supporting information

Manuscript title: „Solid supported block copolymer membranes through interfacial adsorption of charged block copolymer vesicles“.

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Figure 1. AFM image (topography mode (a) and phase (b)) of the polymer material on the HOPG surface six days after sample preparation.

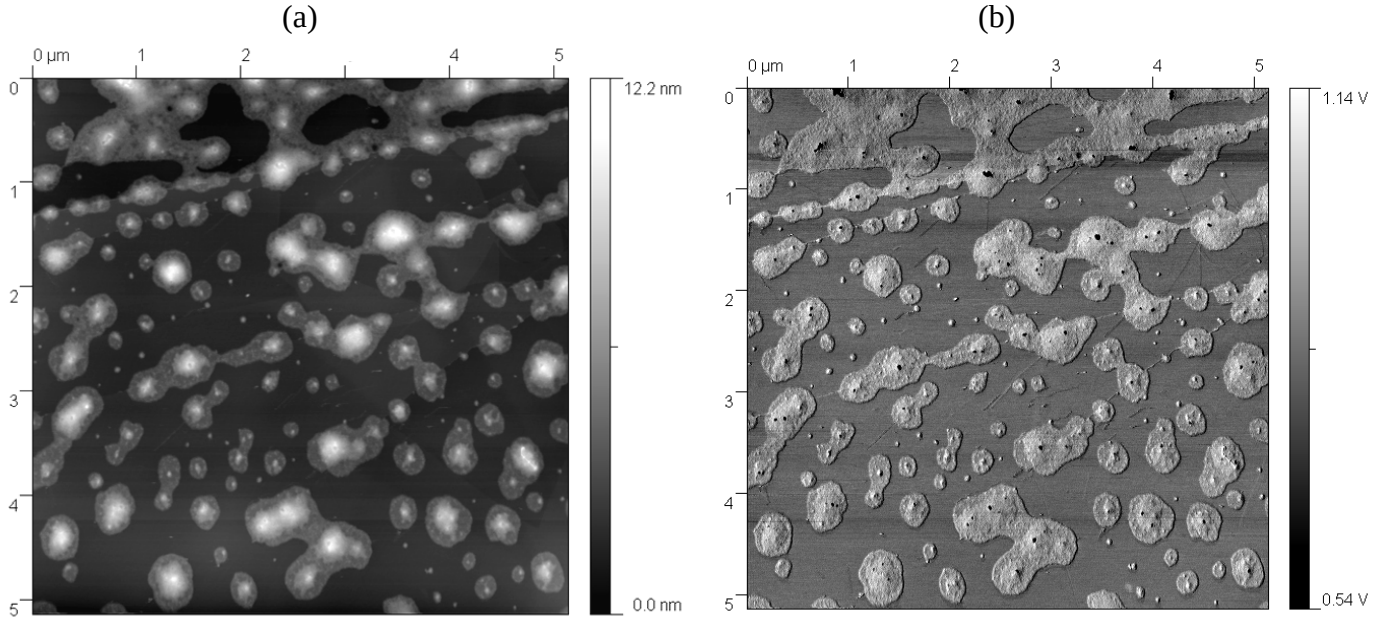

Figure 2. AFM measurement in liquid. Copolymer vesicles deposited onto SiO2 substrate (topography mode – left) from 0,1 wt.% vesicular dispersion. Right image demonstrates the cross-section profiles of two vesicles on the surface. The shape of the peaks reveals spherical particles without deformations indicating that vesicles have inner water inside their cavity. The diameter to height ratio corresponds to flattened vesicles on the surface.

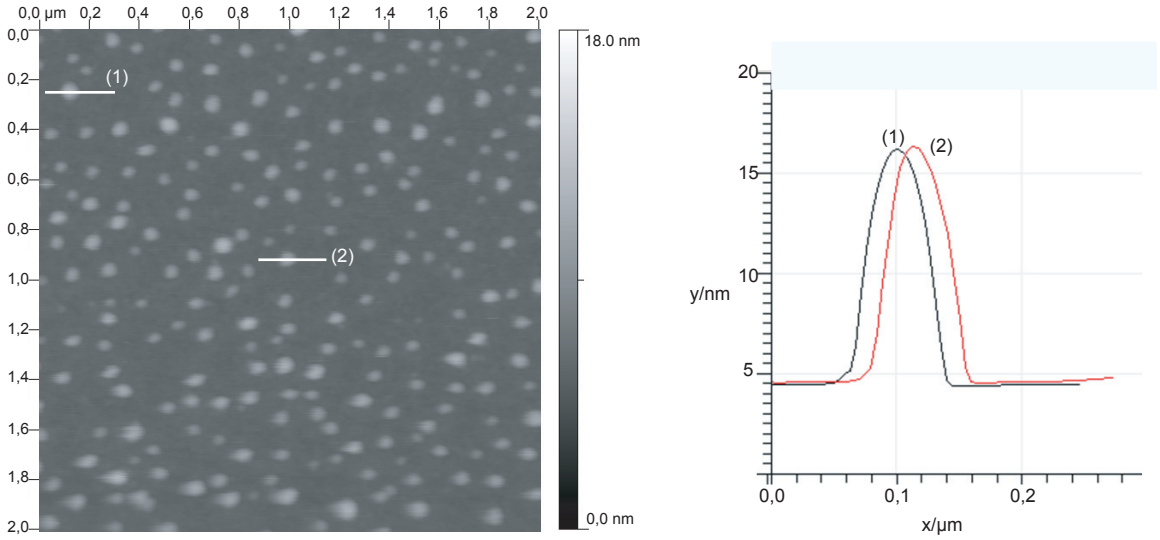

Figure 3. See description below.

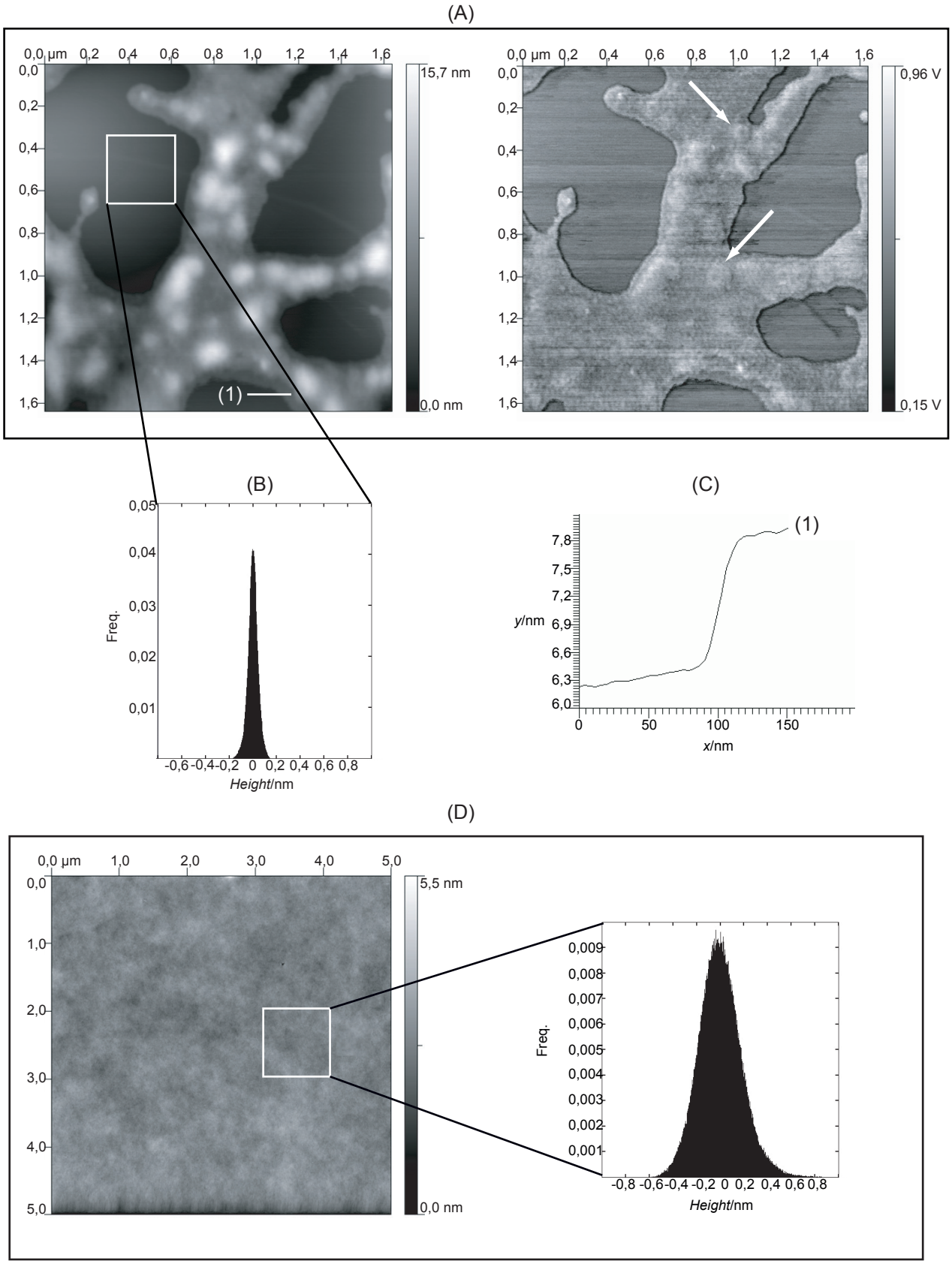

Figure 3. Deposition of the copolymer vesicles on HOPG (A) and mica (D) substrates from acidic dispersion (pH=5, 0.1 wt.%). (A) Overview, topography (left) and phase (right) modes are presented. The HOPG substrate is only partially covered by copolymer material. The collapsed copolymer vesicles are visible with better contrast in the phase mode (right, white arrows). The white frame indicates the region of interest that was taken for the surface analysis. (B) Surface histogram of the uncovered part of the substrate shows a low surface roughness identical to the bare HOPG substrate. Thin rims are visible on the periphery of the covered areas. (C) Example of the cross section profile of the periphery rims. The thickness of the rim corroborates the 1.5±0.04 nm value that was measured for the polymer rims obtained after deposition of the polymer dispersion at higher pH. (D) A large area (5x5 μm) of polymer membrane on freshly cleaved mica substrate shows no defects in the polymer layer. A white frame represents the region of interest that was taken for the surface analysis. (D, right image) The surface histogram demonstrates a roughness of the membrane similar to the one obtained after deposition of the vesicles from dispersion at pH=8.0 (see Figure 3, B in the manuscript).

Figure 4. See description below.

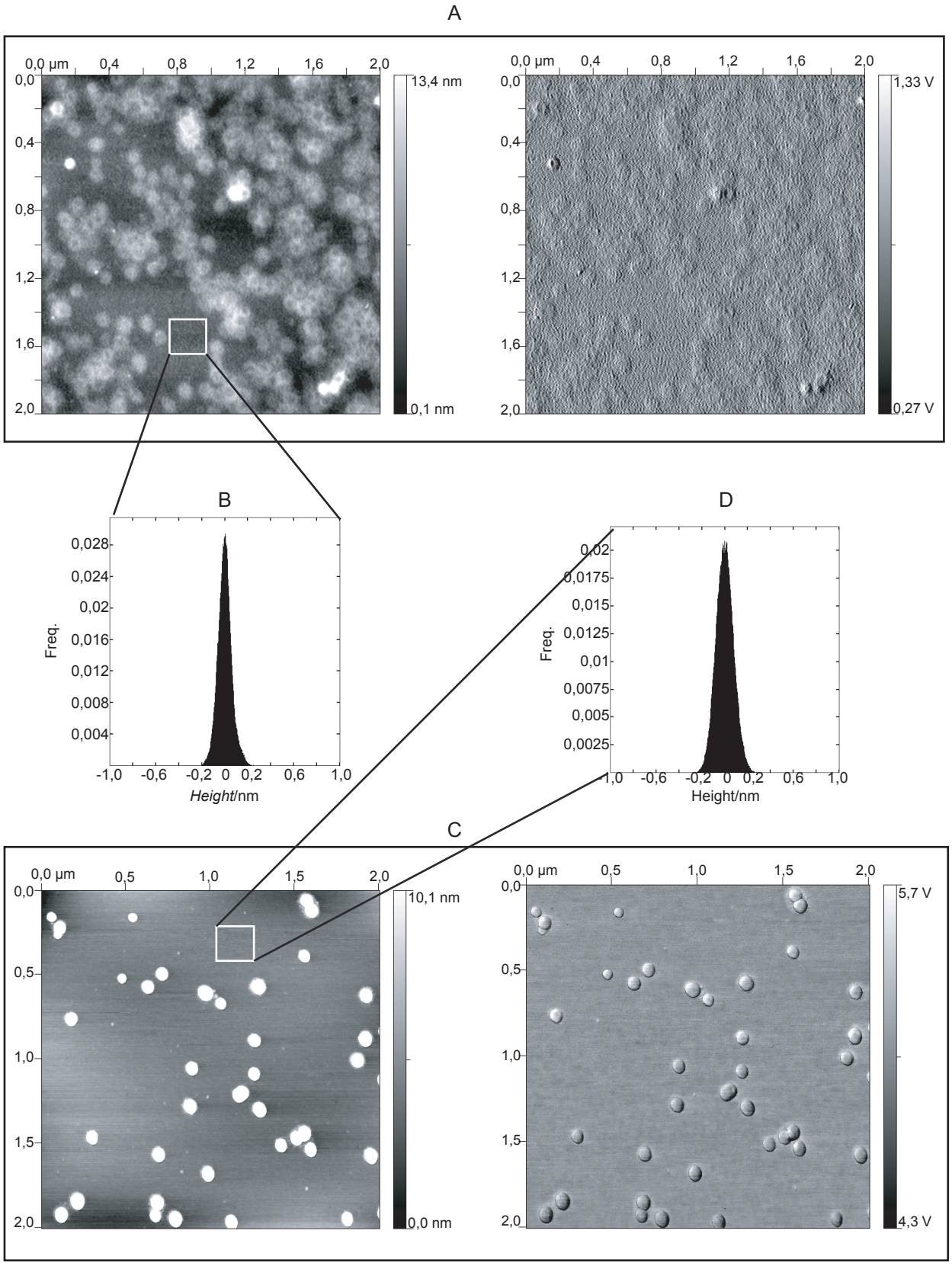

Figure 4. AFM images (topography mode-left, phase-right) of the copolymer vesicles deposited onto SiO_2 substrate from acidic pH=5 (A) and basic pH=9 (C) dispersions (0.1 wt. %). A white frame shows the region of interest that was taken for the surface analysis. (B) Surface histogram of the vesicle free area demonstrates the surface roughness identical to the bare SiO_2 substrate (see manuscript, Figure 2, D). Thus, the copolymer vesicles are adsorpted onto the SiO_2 surface and no formation of a membrane structure occurred. (C) Copolymer vesicles deposited onto SiO_2 surface from a basic dispersion, pH=9 (0.1 wt.%). (D) Surface histogram of the vesicle free area indicates underlying surface roughness identical to the bare SiO_2 substrate (see manuscript, Figure 2, D).

Table 1. Estimation of the average thickness of the copolymer monolayer on the HOPG substrate. Analysis of the cross-section profiles (n=22) was performed using base line correction and data obtained from different scan areas of the sample.

Scan area	Profile	Rim thickness, nm
1	1	1.6
	2	1.4
	3	1.6
	4	1.7
	5	1.3
	6	1.4
	7	1.5
	8	1.4
2	9	1.6
	10	1.5
	11	1.8
	12	1.4
3	13	1.4
	14	1.9
	15	1.4
	16	1.3
4	17	1.7
	18	1.6
	19	1.7
	20	1.4
	21	1.3
	22	1.3
Average		1.505
Standard deviation		0.177
Standard error		0.038

The mean thickness of the copolymer layer on the HOPG (rim thickness) of 1.5±0.04 (standard error) nm is used in the manuscript.

Table 2. Estimation of the average height of the block copolymer vesicles on the SiO_2 substrate. Analysis of the cross-section profiles (n=24) was performed using base line correction and data obtained from different scan areas of the sample.

Scan area	Profile	Vesicular height, nm
1	1	8.9
	2	9.6
	3	10.2
	4	9.1
	5	9.3
	6	10.5
2	7	9.0
	8	8.9
	9	9.6
	10	9.4
	11	9.4
3	12	9.7
	13	9.1
	14	10.8
	15	9.0
	16	9.3
	17	9.4
4	18	9.2
	19	9.1
	20	10.3
	21	8.9
	22	9.4
	23	9.0
	24	9.1
Average		9.425
Standard deviation		0.528
Standard error		0.108

The average height of the collapsed copolymer vesicle on the silicon oxide substrate of 9.4±0.1 (standard error) nm is used in the manuscript.