

Supporting Information:

**Influence of high hydrostatic pressure on solid
supported DPPC bilayer with HA in the presence of
Ca²⁺ ions**

Thomas Zander ^{†,a}, D.C. Florian Wieland ^{† a,}, Akanksha Raj ^b, Paul Salmen ^d, Susanne Dogan ^d,
Andra Dédinaité ^{b,c}, Vasil M. Garamus ^a, Andreas Schreyer ^a, Per Martin Claesson ^{b,c}, Regine
Willumeit-Römer ^a*

^a Helmholtz-Zentrum Geesthacht: Centre for Materials and Coastal Research, Institute of
Materials Research, Max-Planck-Straße 1, 21502 Geesthacht, Germany

^b KTH Royal Institute of Technology, School of Engineering Sciences in Chemistry,
Biotechnology and Health, Department of Chemistry, Surface and Corrosion Science, Drottning
Kristinas väg 51, SE-10044 Stockholm, Sweden

^c RISE Research Institutes of Sweden, Division of Bioscience and Materials, SE-114 86
Stockholm, Sweden, SE-114 86 Stockholm, Sweden

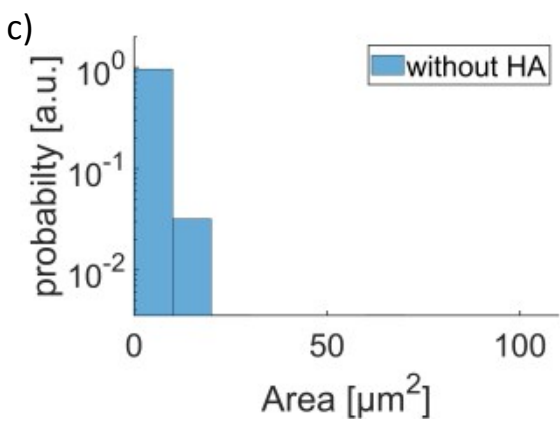
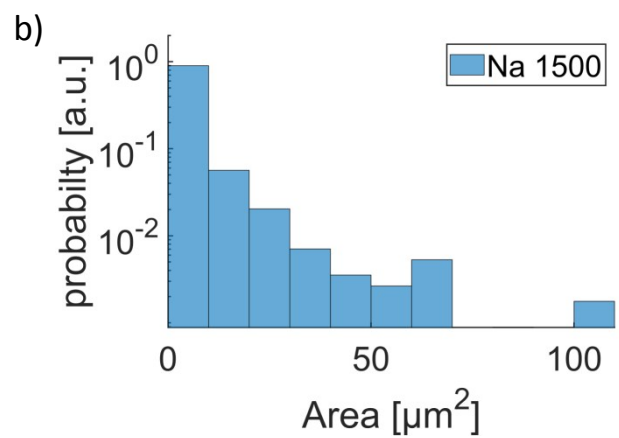
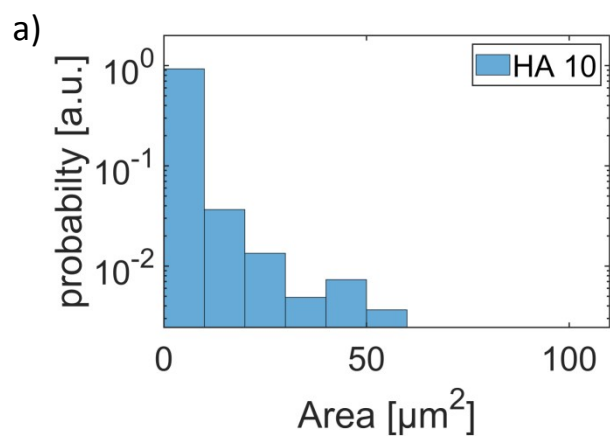
^d Fakultät Physik/DELTA, TU Dortmund, 44221 Dortmund, Germany

* Corresponding Author: Dr. D.C.F. Wieland, Helmholtz Zentrum Geesthacht, Max-Planck Straße 1, 21502 Geesthacht. Email address florian.wieland@hzg.de, phone number +499489986916, fax number.: +499489986917

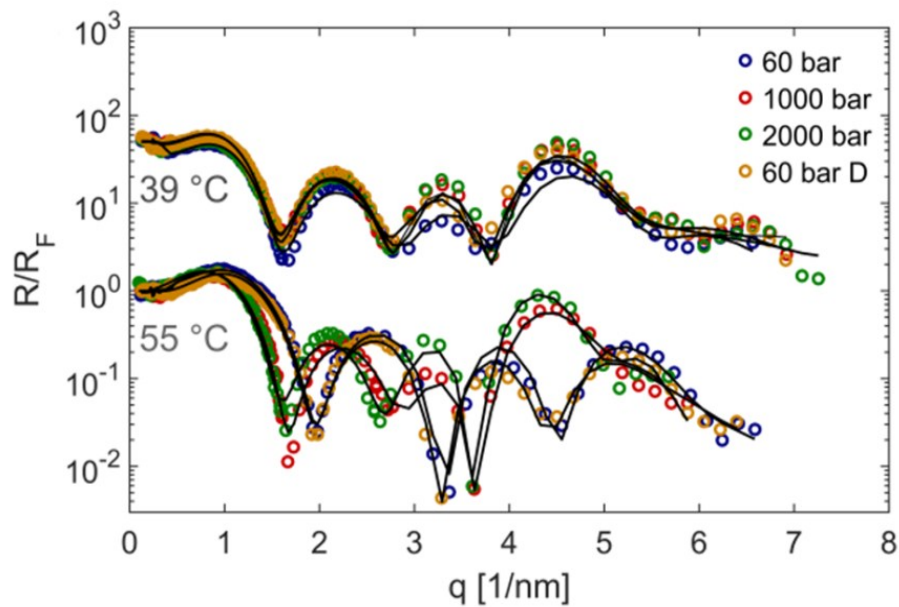
† This authors contributed equally to this work.

S 1 *Electron density of water at different temperatures and pressures.*

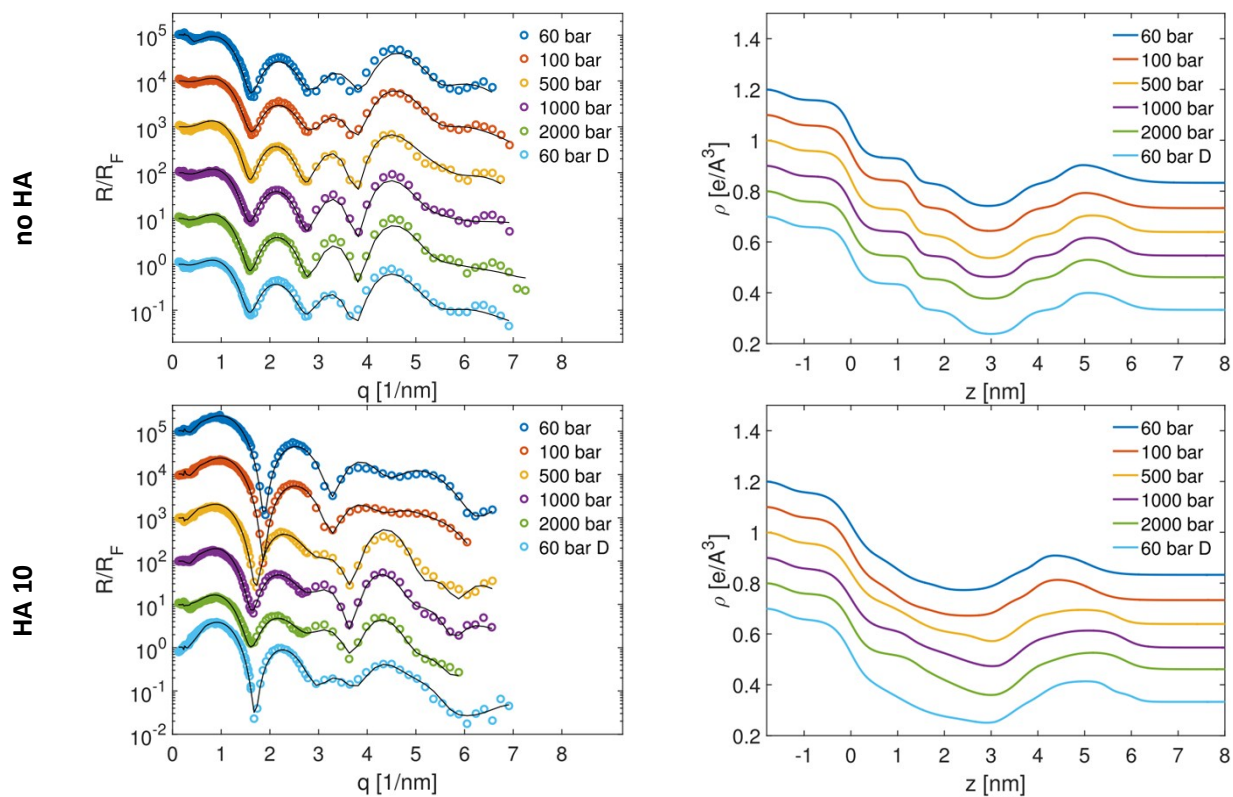
<i>pressure [bar]</i>	<i>39°C</i>	<i>55°C</i>
60	0.3327 e/Å ³	0.3304 e/Å ³
1000	0.3465 e/Å ³	0.3444 e/Å ³
2000	0.3612 e/Å ³	0.3594 e/Å ³



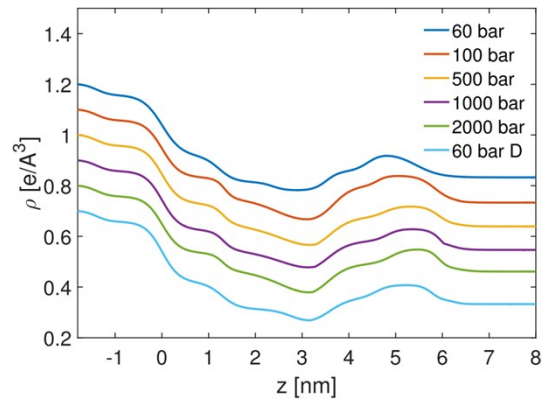
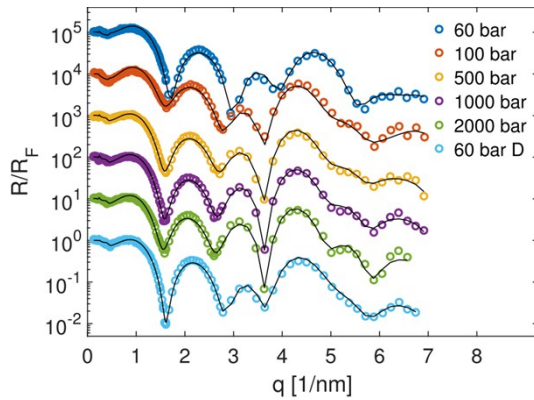
S2 Analysis of the fluorescence images showing the island distribution with respect to size (x-Axis) and probability (y-axis)



S 3 Fresnel normalized reflectivity curves and fits of DPPC samples at 39 °C and 55 °C at different pressures. Offset between 39 °C and 55 °C for clarity.

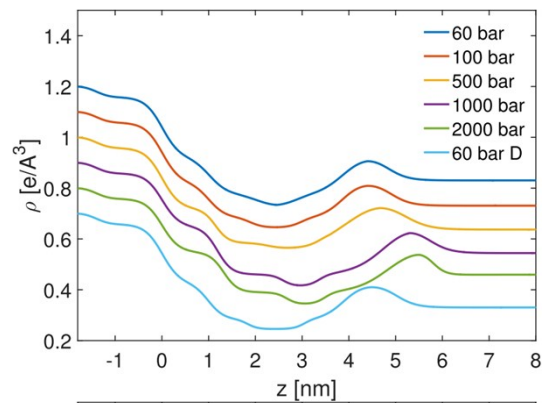
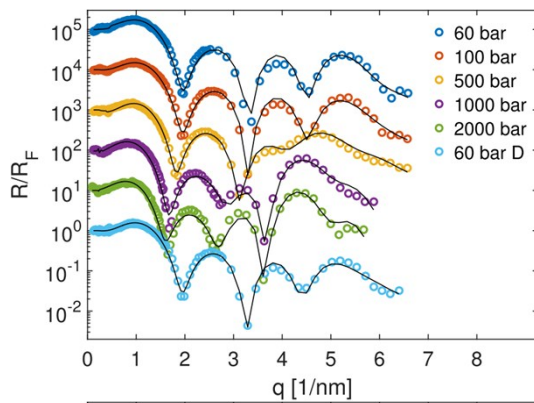


HA 1500

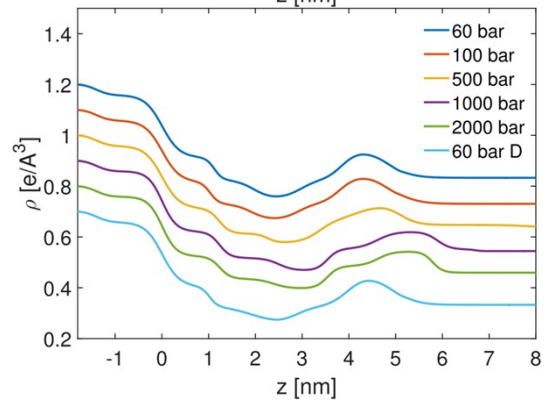
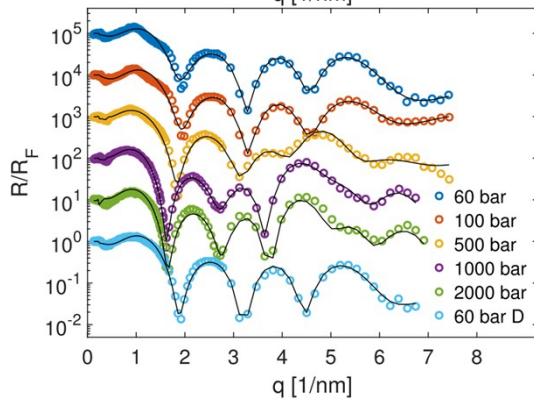


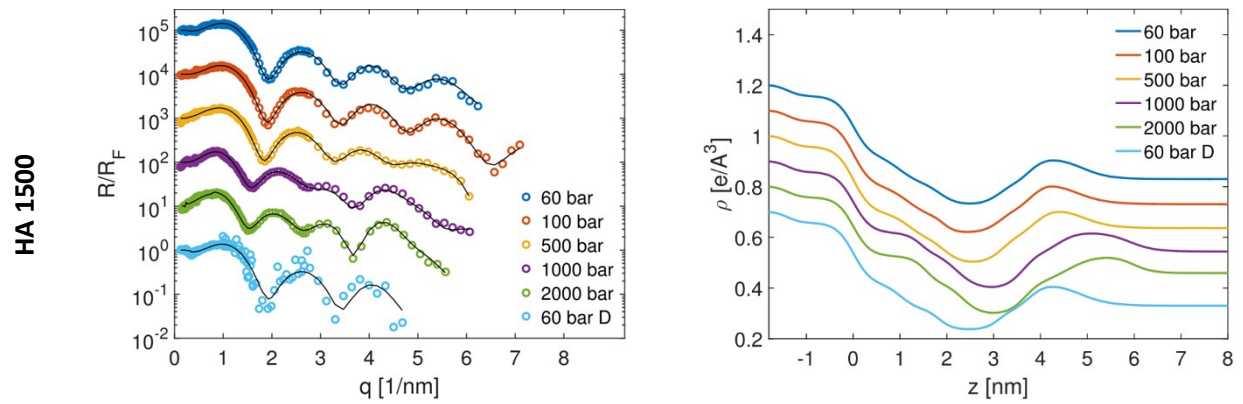
S 4 Fresnel normalized reflectivity curves and electron density profiles for DPPC, DPPC/ HA10 and DPPC/ HA1500 samples measured at 39 °C at different pressures. The vertical offset is for clarity.

no HA



HA 10





S 5 Fresnel normalized reflectivity curves and electron density profiles for DPPC, DPPC/ HA10 and DPPC/ HA1500 samples measured at 39 °C at different pressures. The vertical offset is for clarity.

HA [kDA]	T [°C]	Pressure [bar]	χ^2
-	55	60	0.56
-	55	100	0.32
-	55	500	0.31
-	55	1000	0.85
-	55	2000	0.98
-	55	60	0.37
1500	55	60	0.1
1500	55	100	0.19
1500	55	500	0.09
1500	55	1000	0.15
1500	55	2000	0.14
1500	55	60	2.86
10	55	60	0.48
10	55	100	0.49
10	55	500	0.71
10	55	1000	0.255
10	55	2000	1.01
10	55	60	0.32
-	39	60	0.5
-	39	100	0.27
-	39	500	0.51
-	39	1000	0.42
-	39	2000	0.76
-	39	60	0.45
1500	39	60	0.27
1500	39	100	0.54
1500	39	500	0.2
1500	39	1000	0.26
1500	39	2000	0.36
1500	39	60	0.17
10	39	60	0.33
10	39	100	0.26
10	39	500	0.59
10	39	1000	0.31
10	39	2000	0.59
10	39	60	0.68

S 6 Chi square values for the best fit of the data

roughness σ layer 4 [Å]	4.77	3.94	5.79	6.16	6.16	3.98
thickness layer 4 [Å]	11.02	8.87	11.26	14.05	13.45	8.40
dispersion δ layer 5	0.06	0.06	0.06	0.07	0.07	0.06
roughness σ layer 5 [Å]	3.97	3.89	4.82	4.24	2.51	3.89
thickness layer 5 [Å]	9.20	10.23	11.20	9.04	9.58	11.26

S 8 Values for the fitted slab model for DPPC with NaCl and CaCl at 55°C.

Footprint angle [°]	0.04	0.05	0.06	0.04	0.07	0.03
instrument resolution	0.94	0.94	0.94	0.61	0.86	0.94
dispersion δ of water	0.05	0.05	0.05	0.05	0.05	0.05
dispersion δ of silicon wafer	0.10	0.10	0.10	0.10	0.10	0.10
roughness σ substrate [Å]	2.18	2.18	2.18	2.18	2.18	2.18
dispersion δ silicon dioxide layer	0.09	0.09	0.09	0.09	0.09	0.09
roughness silicon dioxide [Å]	3.37	3.43	3.42	3.38	3.24	3.37
layer thickness silicon dioxide	14.07	14.07	14.07	14.07	14.07	14.07
dispersion δ layer 1	0.06	0.06	0.06	0.06	0.06	0.06
roughness σ layer 1 [Å]	3.36	4.17	3.82	2.68	2.85	3.36
thickness layer 1 [Å]	10.19	11.56	11.86	14.36	15.47	10.19
dispersion δ layer 2	0.04	0.04	0.04	0.05	0.04	0.04
roughness σ layer 2 [Å]	2.64	2.38	3.48	4.04	3.40	2.64
thickness layer 2 [Å]	8.15	7.57	7.47	7.79	7.93	8.15
dispersion δ layer 3	0.03	0.03	0.03	0.03	0.03	0.03
roughness σ layer 3 [Å]	2.64	3.45	3.47	3.48	3.30	2.64
thickness layer 3 [Å]	12.65	12.16	12.54	14.06	13.28	12.65
dispersion δ layer 4	0.04	0.04	0.04	0.05	0.05	0.04
roughness σ layer 4 [Å]	3.51	3.58	3.92	3.71	5.09	3.51
thickness layer 4 [Å]	6.67	6.85	7.01	7.70	9.43	6.67
dispersion δ layer 5	0.06	0.06	0.06	0.06	0.06	0.06
roughness σ layer 5 [Å]	5.89	6.23	5.45	4.87	3.80	5.89
thickness layer 5 [Å]	10.51	8.87	9.96	15.00	13.58	10.51

S 9 Values for the fitted slab model for DPPC with HA with 1500kDa and NaCl and CaCl at 55°C

	50 bar	100 bar	500 bar	1000 bar	2000 bar	60 bar
Footprint angle [°]	0.03	0.03	0.03	0.03	0.03	0.03
instrument resolution	0.96	1.03	0.88	0.66	0.56	0.96
dispersion δ of water	0.05	0.05	0.05	0.05	0.05	0.05
dispersion δ of silicon wafer	0.10	0.10	0.10	0.10	0.10	0.10
roughness σ substrate [Å]	2.18	2.18	2.18	2.18	2.18	2.18
dispersion δ silicon dioxide layer	0.09	0.09	0.09	0.09	0.09	0.09
roughness silicon dioxide [Å]	3.35	3.37	3.37	2.74	2.74	3.32

roughness σ layer 1 [Å]	4.14	4.19	5.61	2.19	2.94	6.57
thickness layer 1 [Å]	10.12	9.62	12.87	12.87	14.63	10.95
dispersion δ layer 2	0.04	0.04	0.04	0.05	0.05	0.04
roughness σ layer 2 [Å]	2.47	3.03	2.98	9.39	6.96	3.95
thickness layer 2 [Å]	8.71	8.48	14.56	10.44	8.02	16.29
dispersion δ layer 3	0.04	0.04	0.04	0.03	0.03	0.03
roughness σ layer 3 [Å]	3.76	2.71	4.19	4.19	4.19	4.35
thickness layer 3 [Å]	14.04	14.33	8.09	12.04	13.25	6.66
dispersion δ layer 4	0.05	0.05	0.05	0.06	0.06	0.05
roughness σ layer 4 [Å]	2.23	2.78	2.40	3.18	4.21	3.60
thickness layer 5 [Å]	6.72	6.58	8.77	9.21	9.04	7.23
dispersion δ layer 6	0.06	0.06	0.06	0.06	0.06	0.06
roughness σ layer 6 [Å]	4.71	4.53	2.94	3.22	3.48	2.05
thickness layer 6 [Å]	11.11	12.49	12.66	13.97	13.50	13.78

S 12 Values for the fitted slab model for DPPC with HA 10kDa and NaCl and CaCl at 39°C