

Electronic Supplementary Information

Tunable Wettability of Hierarchical Structured Coatings Derived from One-Step Synthesized Raspberry-Like Poly(styrene-acrylic acid) Particles

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Table S1 Detailed experimental conditions for the preparation of raspberry-like P(S-AA) particles and pH and zeta potential of the final P(S-AA) colloidal suspensions.

Sample	S (g)	AA (g)	DVB (g)	KPS (g)	Water (mL)	pH	Zeta Potential (mV)	Mean Diameter (nm)
1	0.80	2.20	/	0.07	100	2.36	-45.25	113
2	1.47	1.53	/	0.07	100	2.42	-55.37	122
3	1.77	1.23	/	0.07	100	2.43	-47.18	132
4	2.05	0.95	/	0.07	100	2.46	-54.21	128
5	2.56	0.44	/	0.07	100	2.49	-51.90	195
6	1.18	1.71	0.11	0.07	100	2.42	-45.46	166
7	1.65	1.14	0.21	0.07	100	2.44	-45.80	195
8	1.59	1.10	0.31	0.07	100	2.47	-47.81	180
9	1.53	1.06	0.41	0.07	100	2.44	-52.36	188
10	0.70	1.95	0.35	0.07	100	2.36	-49.35	170
11	1.31	1.36	0.33	0.07	100	2.44	-50.67	190
12	1.84	0.85	0.31	0.07	100	2.44	-43.40	199
13	2.31	0.40	0.29	0.07	100	2.45	-49.31	197

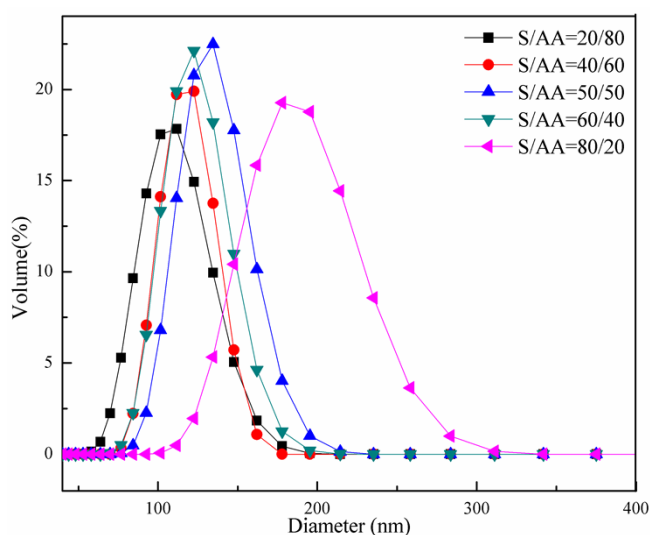


Fig. S1 DLS size distribution of P(S-AA) particles with different monomer mass ratio.

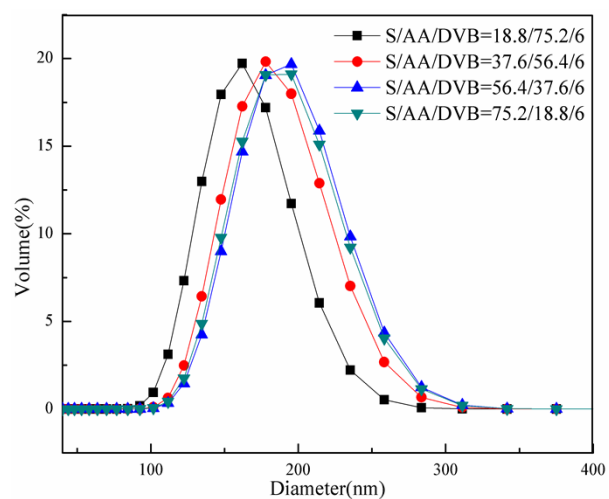


Fig. S2 DLS size distribution of P(S-AA) particles prepared with 6% DVB mole ratio but different S and AA ratios

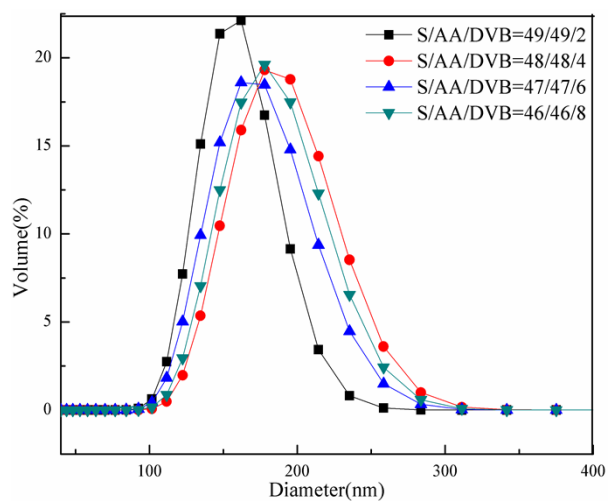


Fig. S3 DLS size distribution of P(S-AA) particles prepared with different DVB mole ratios

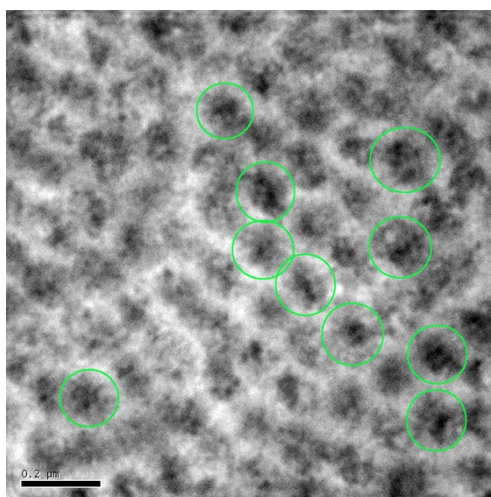


Fig. S4 A typical section TEM image of the P(S-AA) particles prepared with S/AA=50/50

Table S2 Elemental composition of P(S-AA) particles with different monomer mass ratio.

S/AA	20/80	40/60	50/50	60/40	80/20
C (%)	59.17	81.64	84.36	87.07	89.56
H (%)	6.207	7.264	7.554	7.228	7.723
O ^a) (%)	34.623	11.096	8.086	5.702	2.717

a) Calculated by the formula: 100%-C%-H%

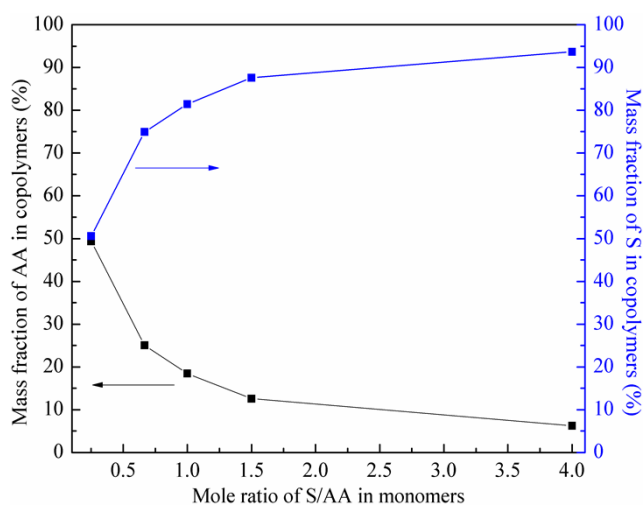


Fig. S5 Constituents in the ultimate P(S-AA) particles prepared with different monomer mole ratios.

Table S3 Elemental composition of P(S-AA) particles prepared with 6% DVB mole ratio but different S and AA ratios

S/AA/DVB	18.8/75.2/6	37.6/56.4/6	47/47/6	56.4/37.6/6	75.2/18.8/6
C (%)	70.11	74.81	80.00	81.82	87.03
H (%)	6.811	6.989	7.137	7.232	7.415
O ^a) (%)	23.079	18.201	12.863	10.948	5.555

a) Calculated by the formula: 100%-C%-H%

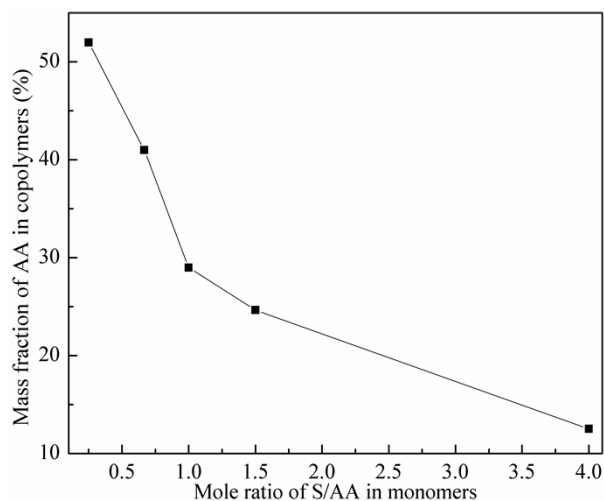


Fig. S6 Mass fraction of AA in the ultimate P(S-AA) particles prepared with 6% DVB mole ratio but different S and AA ratios.

Table S4 Elemental composition of P(S-AA) particles prepared with different DVB mole ratios.

S/AA/DVB	49/49/2	48/48/4	47/47/6	46/46/8
C (%)	82.24	81.06	80.00	77.50
H (%)	7.223	7.185	7.137	6.992
O ^a (%)	10.537	11.755	12.863	15.508

a) Calculated by the formula: $100\% - C\% - H\%$

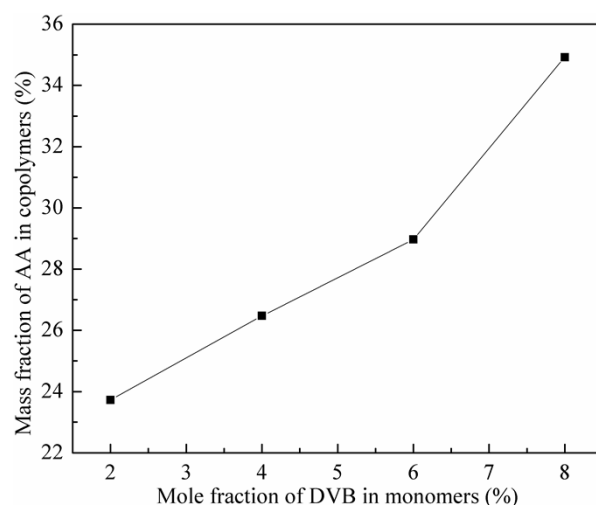


Fig. S7 Mass fraction of AA in the ultimate P(S-AA) particles prepared with different DVB mole ratios.

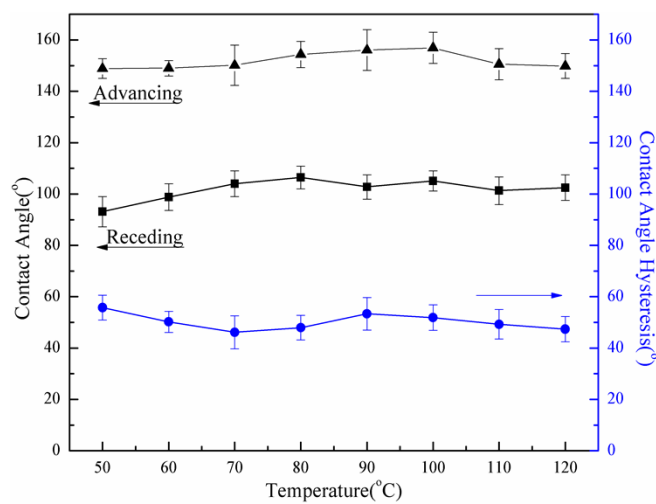
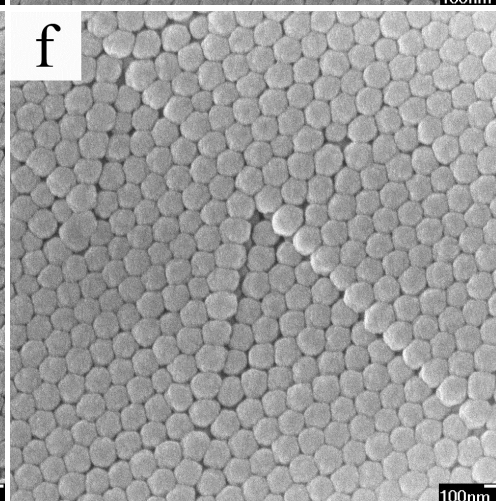
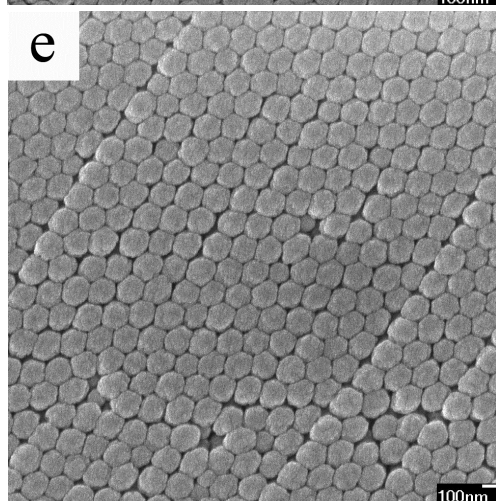
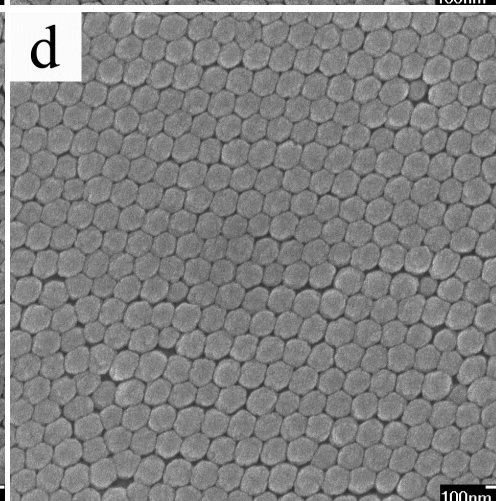
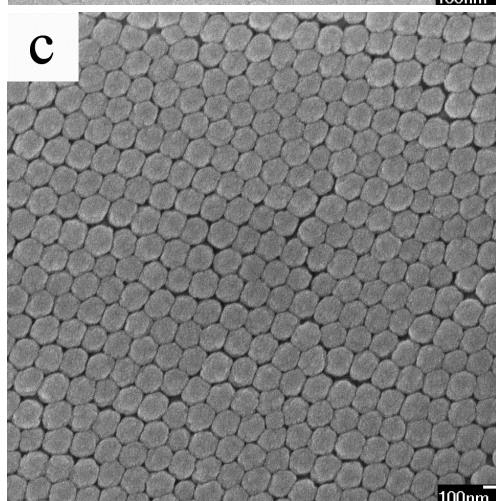
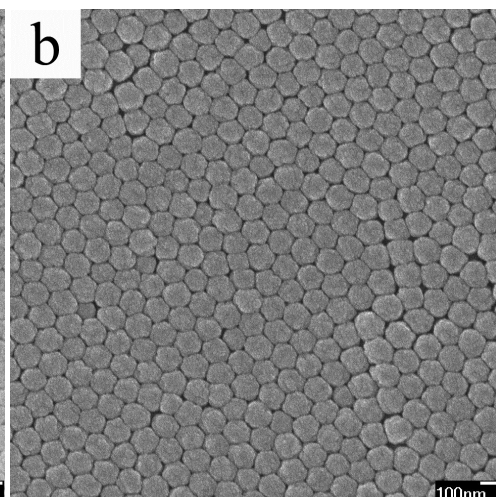
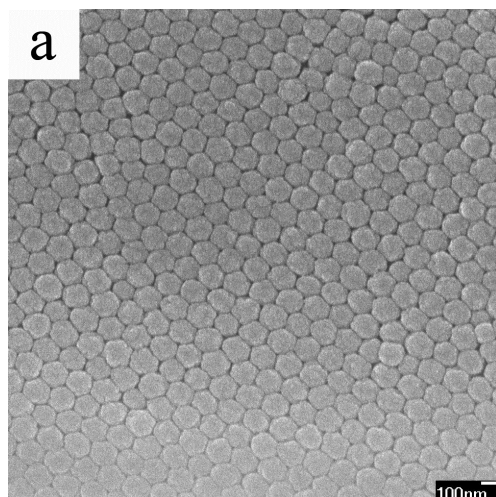


Fig. S8 Advancing contact angles, receding contact angles and contact angle hysteresises of the coatings assembly from particles prepared with 60% S and 40% AA fabricated at different assembly temperatures.



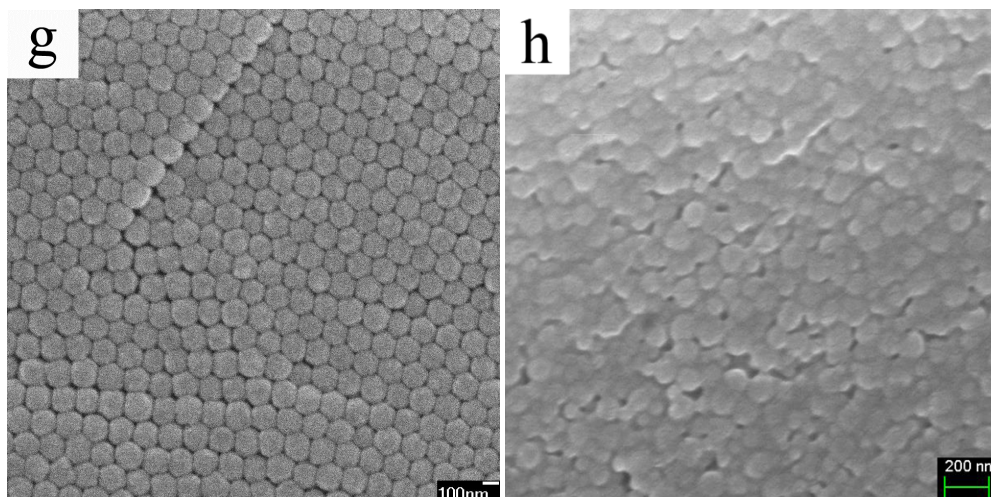


Fig. S9 SEM images of the coatings assembly from particles prepared with 60% S and 40% AA fabricated at (a) 40, (b) 50, (c) 60, (d) 70, (e) 80, (f) 90, (g) 100 and (h) 110 °C.

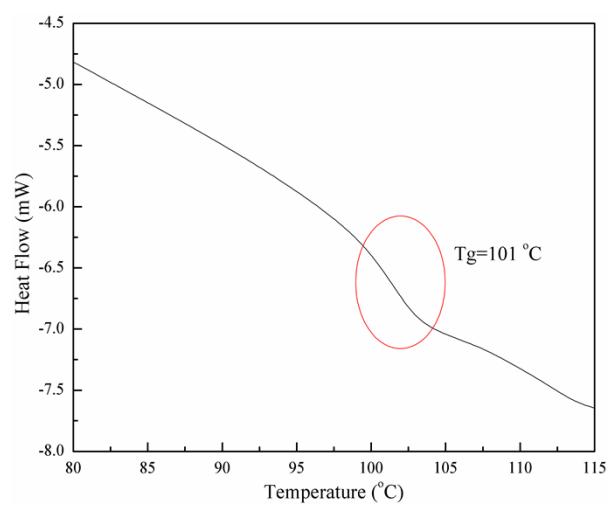
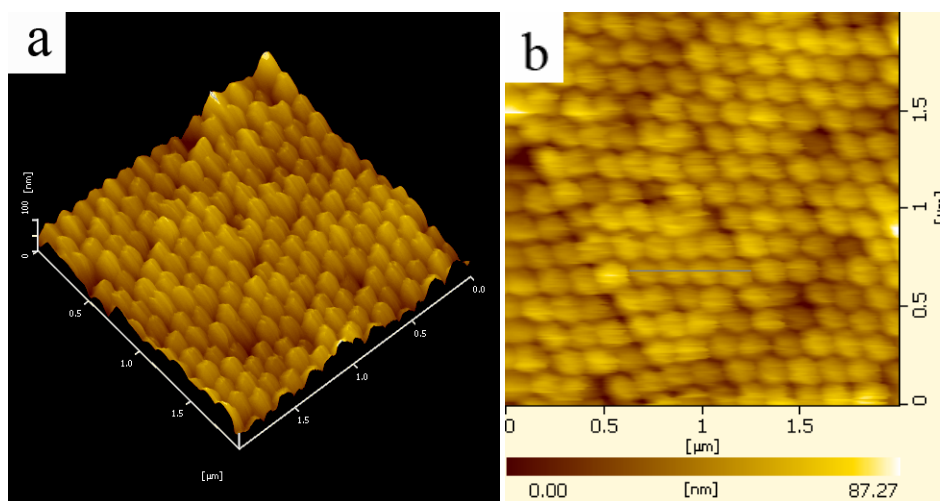


Fig. S10 DSC curve of P(S-AA) raspberry-like particles prepared with 60% S and 40% AA.



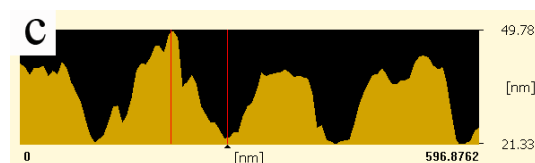


Fig. S11 Typical 3-dimensional AFM image (a), height image (b) and cross-sectional profile (c) of the coatings assembly from the particles prepared with 60% S and 40% AA fabricated at room temperature.

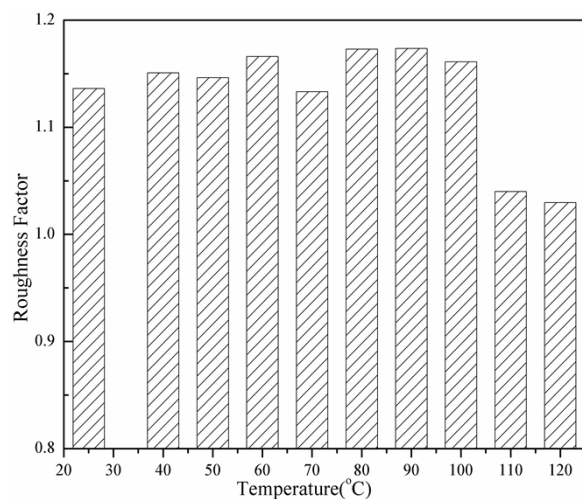
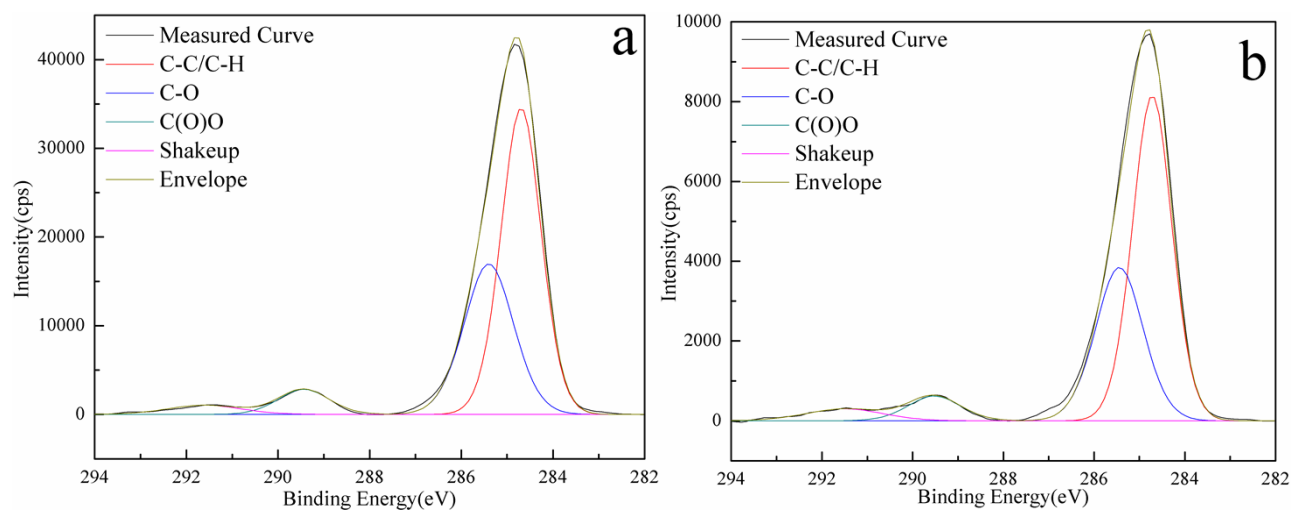


Fig. S12 Roughness factors of the coatings assembly from particles prepared with 60% S and 40% AA fabricated at different temperatures.



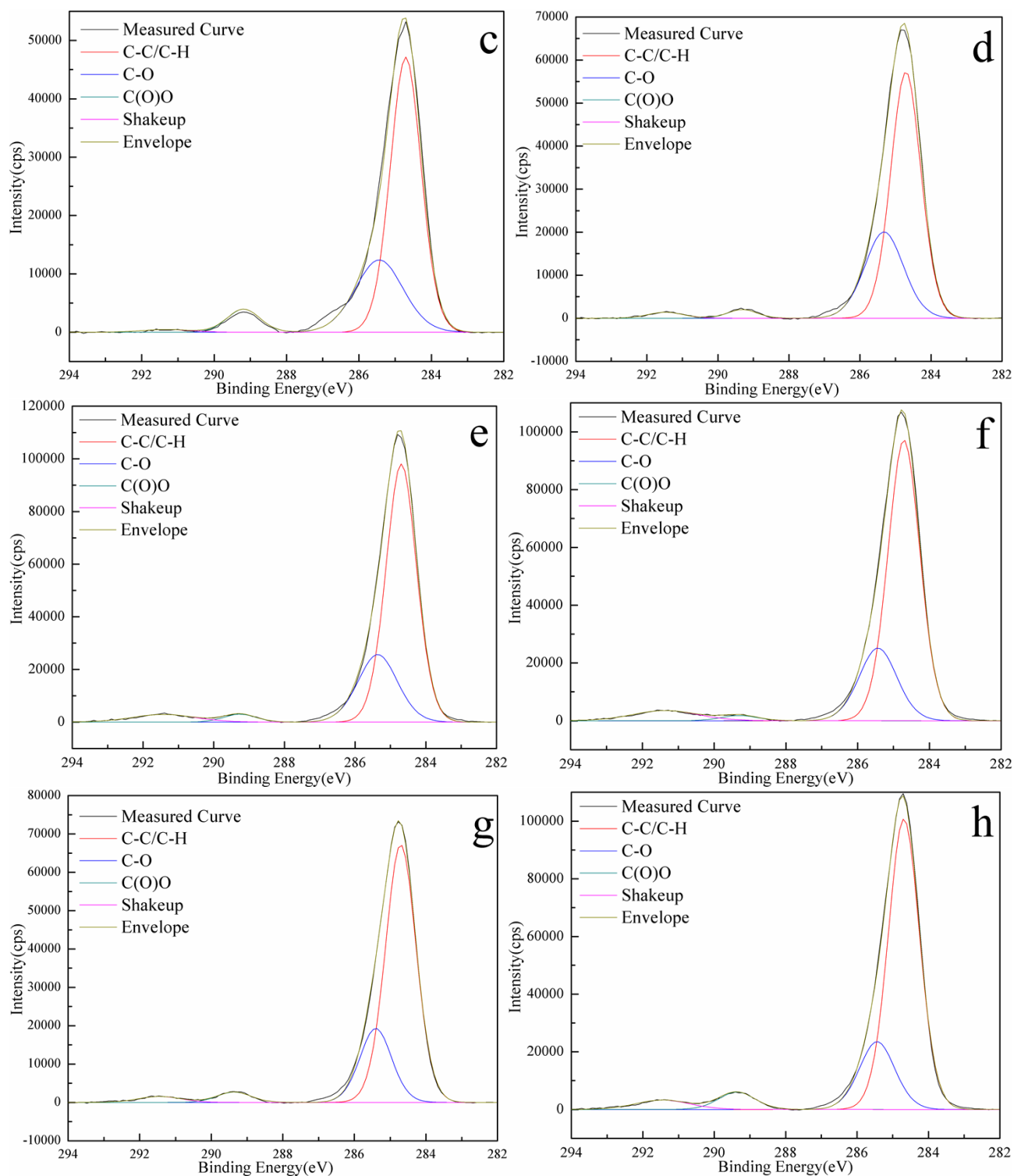
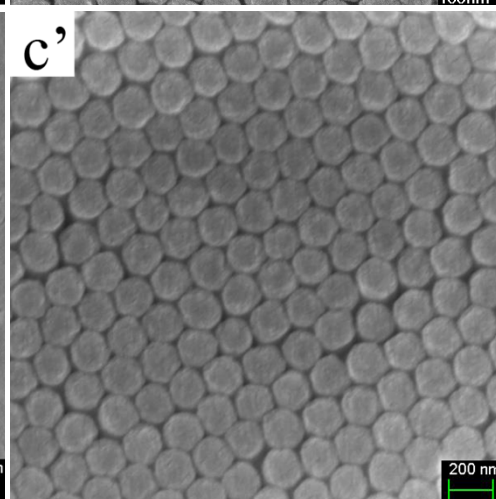
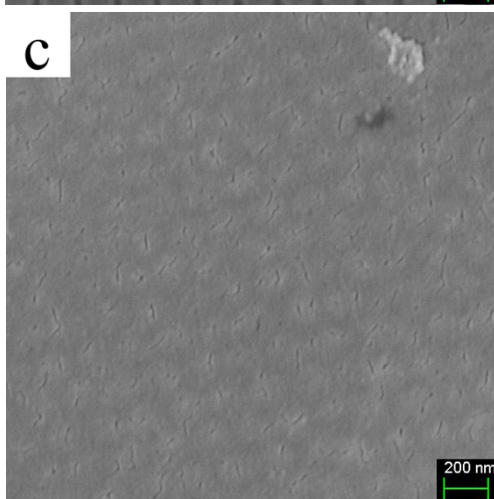
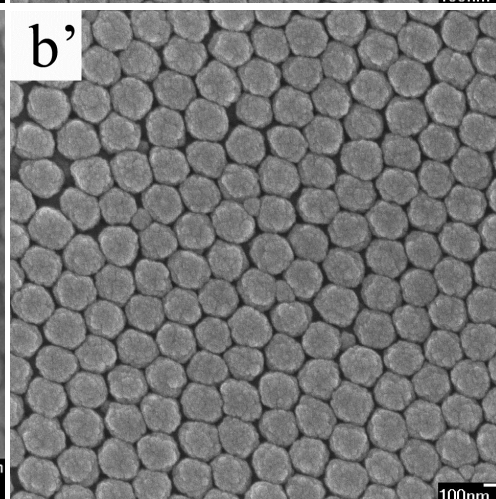
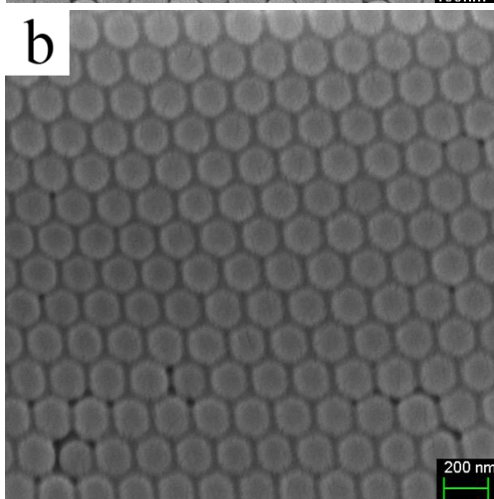
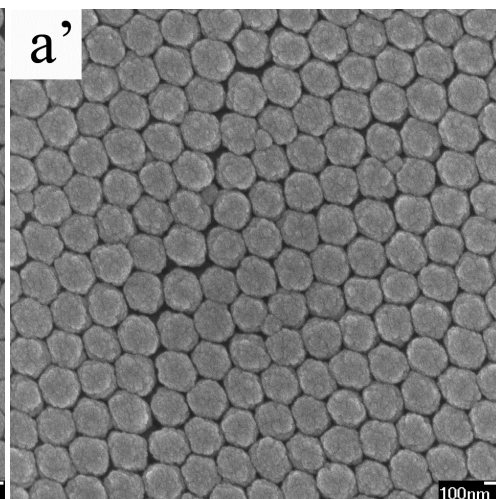
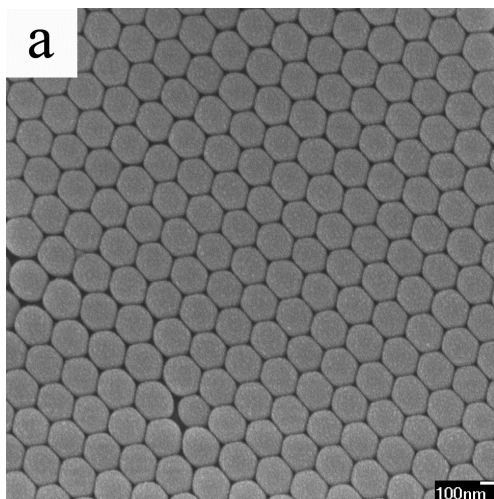


Fig. S13 XPS results of the coatings assembly from particles prepared with 60% S and 40% AA fabricated at (a) 40, (b) 50, (c) 60, (d) 70, (e) 80, (f) 90, (g) 100 and (h) 110 °C.



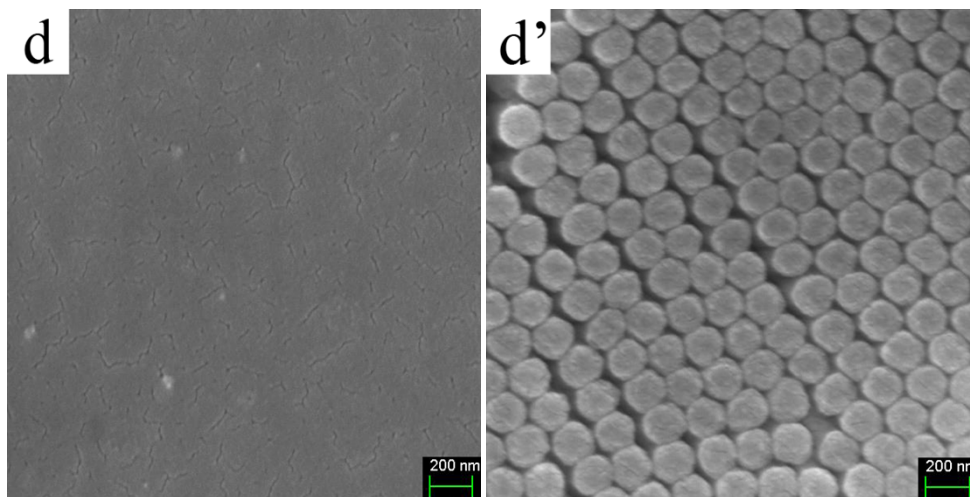


Fig. S14 SEM images of the coatings assembly from the relative rough particles prepared with 80% S and 20% AA fabricated at (a) 90, (b) 100, (c) 110 and (d) 120 °C, and with 75.2% S, 18.8% AA and 6% DVB fabricated at (a') 90, (b') 100, (c') 110 and (d') 120 °C.