Electronic Supplementary Material (ESI) for Soft Matter.

Supplementary Information for

Synthesis of smart dual-responsive microgels: Correlation between applied surfactants and obtained particle morphology

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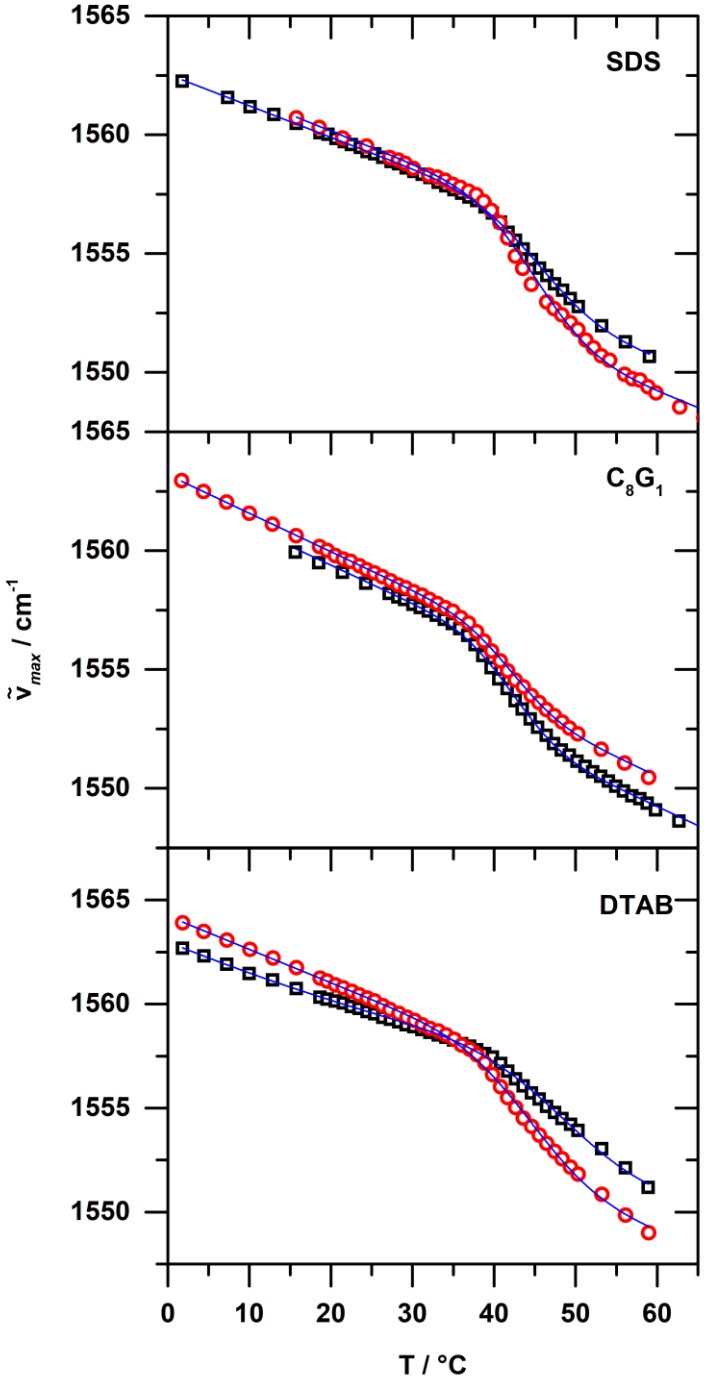

Figure S1: Swelling behaviour of microgels synthesized with a nominal content of 10 mol% acrylic acid investigated with FTIR spectroscopy. Measurements were performed at the native pH of the microgel samples of about 3.5. The microgels were synthesized in presence of surfactant concentrations corresponding to 8.3 % (black) or 25 % (red) of the respective cmc of the surfactants present during the synthesis. Blue lines indicate the fits with Eq. 1.

Table S1: Results from fits with Eq. 1.

surfactant	**DTAB**		**SDS**		**C8G1**	
$c_{surfactant}$ /mol·L^{-1}	**1.25**	**3.75**	**0.69**	**2.08**	**1.25**	**4.5**
acrylic acid	5 mol%					
	pH 4					
T / °C	44.3	46.2	40.5	40.3	39.7	41.5
B / °C	7.48	8.33	6.80	4.24	5.23	7.37
A / cm^{-1}	2.40	1.85	2.28	2.09	1.73	2.53
m1 / °C^{-1}	-0.13	-0.16	-0.13	-0.15	-0.19	-0.13
m2·1000 / °C^{-2}	0	0.17	0	0	0	0
v_o / cm^{-1}	1560.8	1560.3	1559.9	1560.5	1561.9	1559.8
onset / °C	36.8	37.8	33.7	36.1	34.5	34.1
acrylic acid	5 mol%					
	pH 7					
T / °C	52.9	49.6	47.4	39.6	52.9	52.4
B / °C	7.83	7.30	3.47	2.83	8.22	9.63
A / cm^{-1}	2.59	3.29	0.51	2.06	2.19	2.53
m1 / °C^{-1}	-0.15	-0.13	-0.13	-0.20	-0.13	-0.15
m2·1000 / °C^{-2}	0	0	0	0.11	0	0.28
v_o / cm^{-1}	1562.0	1560.0	1562.1	1562.2	1560.4	1560.0
onset / °C	45.1	42.3	43.9	36.8	44.7	42.7
acrylic acid	10 mol%					
	pH 4					
T / °C	44.5	48.9	45.5	45.0	42.4	42.2
B / °C	9.14	11.86	8.51	8.06	6.80	6.86
A / cm^{-1}	2.77	3.06	2.00	2.70	1.87	1.48
m1 / °C^{-1}	-0.16	-0.16	-0.13	-0.14	-0.16	-0.16
m2·1000 / °C^{-2}	0	0.89	0	0	0	0
v_o / cm^{-1}	1561.5	1559.9	1560.5	1560.2	1560.7	1561.7
onset / °C	35.4	37.1	37.0	37.0	35.6	35.3

Table S2: Results of titration experiments. The sample names are in accordance with Table 1 in the manuscript. For the experiments HCl was added to the diluted microgel suspension and the solution was titrated with NaOH.

Sample	n(AAc) / mmol	m(AAc) / mg	m (MG) / mg	**relative incorporation / wt%**
SDS 1	0.015	1.127	15.084	**7.5**
SDS 2	0.004	0.333	5.268	**6.3**
SDS 3	0.025	1.831	13.873	**13.2**
SDS 4	0.011	0.824	5.892	**13.9**
DTAB 1	0.016	1.155	11.169	**10.3**
DTAB 2	0.006	0.419	3.984	**10.5**
DTAB 3	0.018	1.299	8.211	**15.8**
DTAB 4	0.004	0.346	2.355	**14.6**
C_8G_1 1	0.023	1.681	25.25	**6.7**
C_8G_1 2	0.021	1.491	17.802	**8.4**
C_8G_1 3	0.025	1.853	18.699	**9.9**
C_8G_1 4	0.022	1.568	12.582	**12.5**

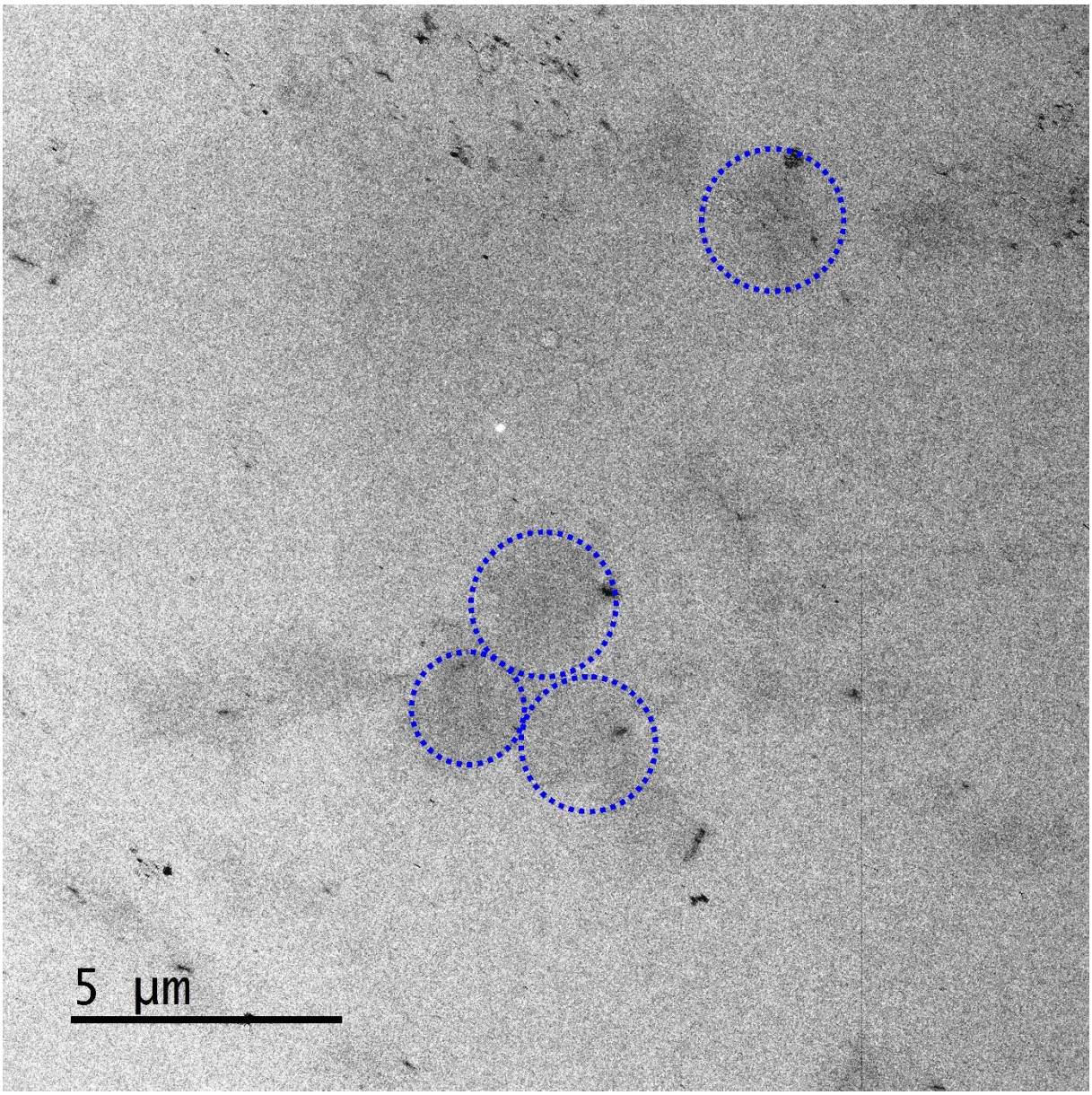

Figure S2: Dry state TEM image of PNIPAM-*co*-AAc microgels synthesized in the presence of 3.75 mM DTAB (25 % of the cmc). A high polydispersity was observed for all positions, which were imaged on the TEM grid. Some of the microgels are highlighted by the blue dashed lines.

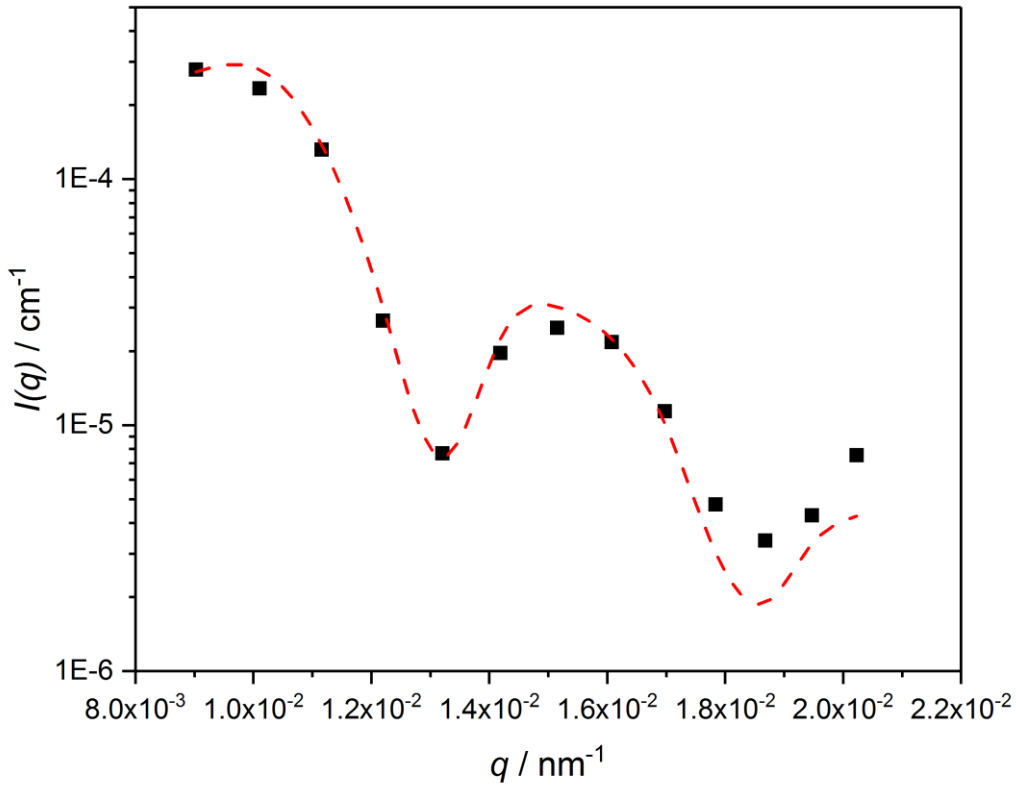

Figure S3: Form factor analysis of static light scattering data at 10 °C of microgels synthesized in the presence of DTAB. The fits performed with SASview and the fuzzy sphere model indicate a particle radius of 592 nm with a fuzziness of 59 nm and a PDI of 0.04.