Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

ELECTRONIC SUPPORTING INFORMATION

Exploring the transition of polydopamine-shelled perfluorohexane emulsion droplets into microbubbles using small- and ultra-small-angle neutron scattering

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SUPPLEMENTARY FIGURES

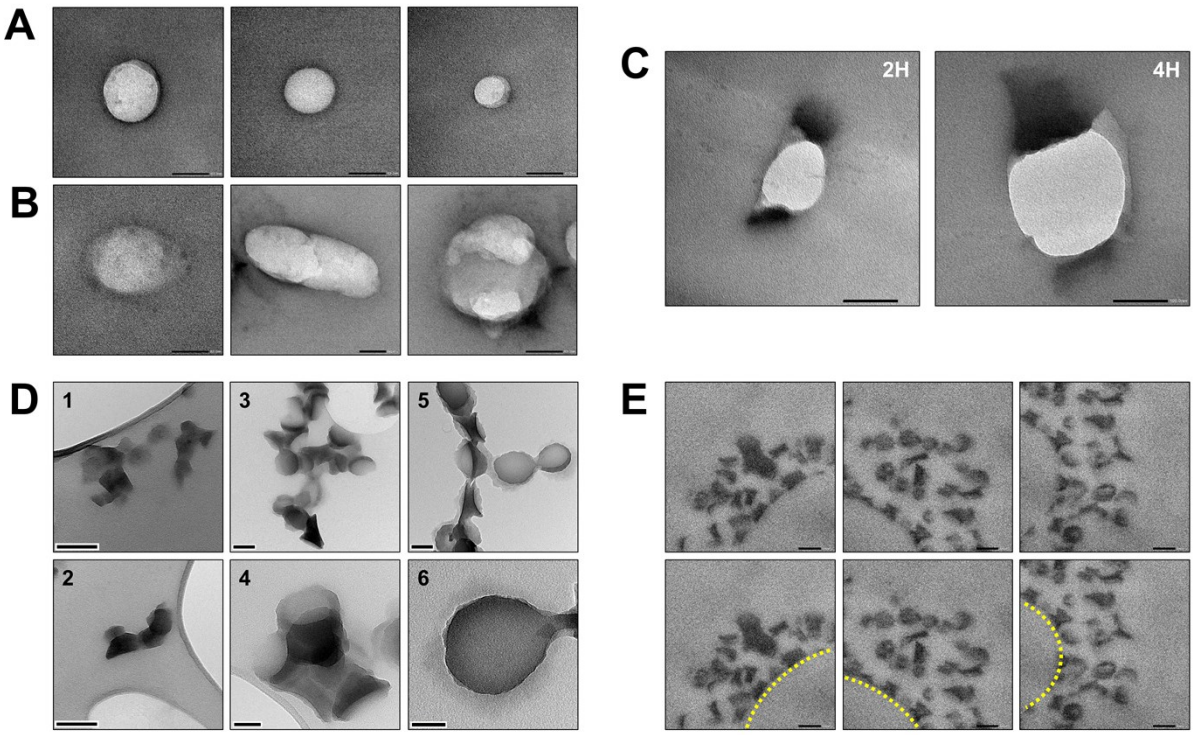

Figure S1. Representative transmission electron micrographs. PDA/PFH emulsion droplets with polymerisation times of 2 hours (**A**) and 4 hours (**B**). Emulsion droplets with broken and "flipped" PDA shells (**C**). Collapsed, dried PDA shells of PDA/PFH emulsion droplets with polymerisation times of 1 hour (**D1** and **D2**), 3 hours (**D3** and **D4**), and 5 hours (**D5** and **D6**). Collapsed PDA shells surrounding curved regions that are potentially interfaces of pre-existent emulsions or bubbles (**E**). Yellow lines indicate the suspected interface of the colloidal material. Scale bars = 100 nm (**A**, **B**, **C, D1**–**D3**, **D5**, **D6**, and **E**) and 50 nm (**D4** and **D6**).

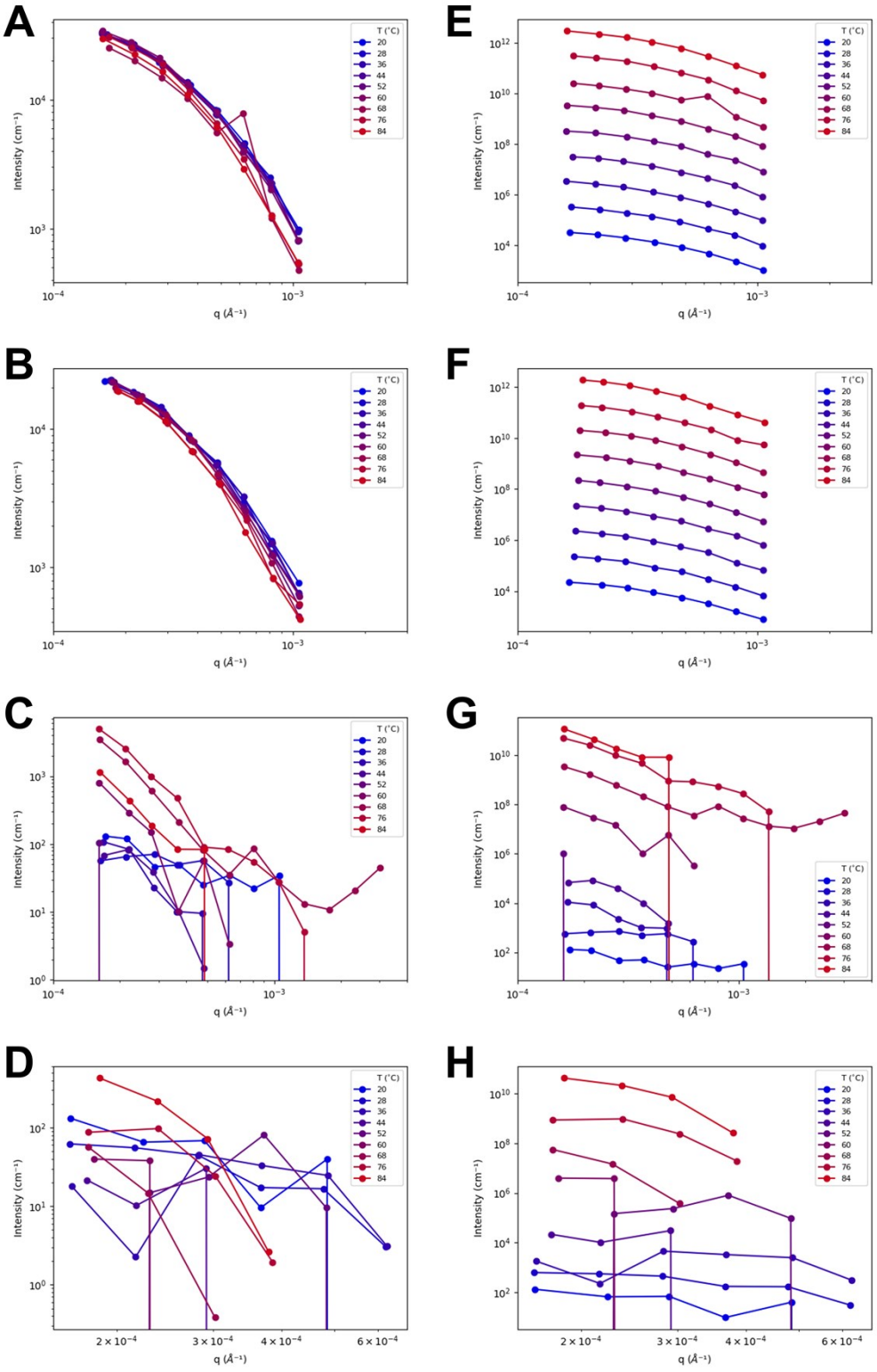

Figure S2. 2D plots of the USANS spectra of samples 2H (**A**) and 4H (**B**) in bubble-matched medium (9% D_2O/ 91% H_2O) and of samples 2H (**C**) and 4H (**D**) in droplet-matched medium (61% D_2O/ 39% H_2O) at different temperatures. **E**, **F**, **G**, and **H** shows **A**, **B**, **C**, and **D**, respectively, with vertical offset (10× original scattering intensity per temperature increment). Scattering intensities in 61% D_2O/ 39% H_2O and in 9% D_2O/ 91% H_2O arise from microbubbles and emulsion droplets, respectively.

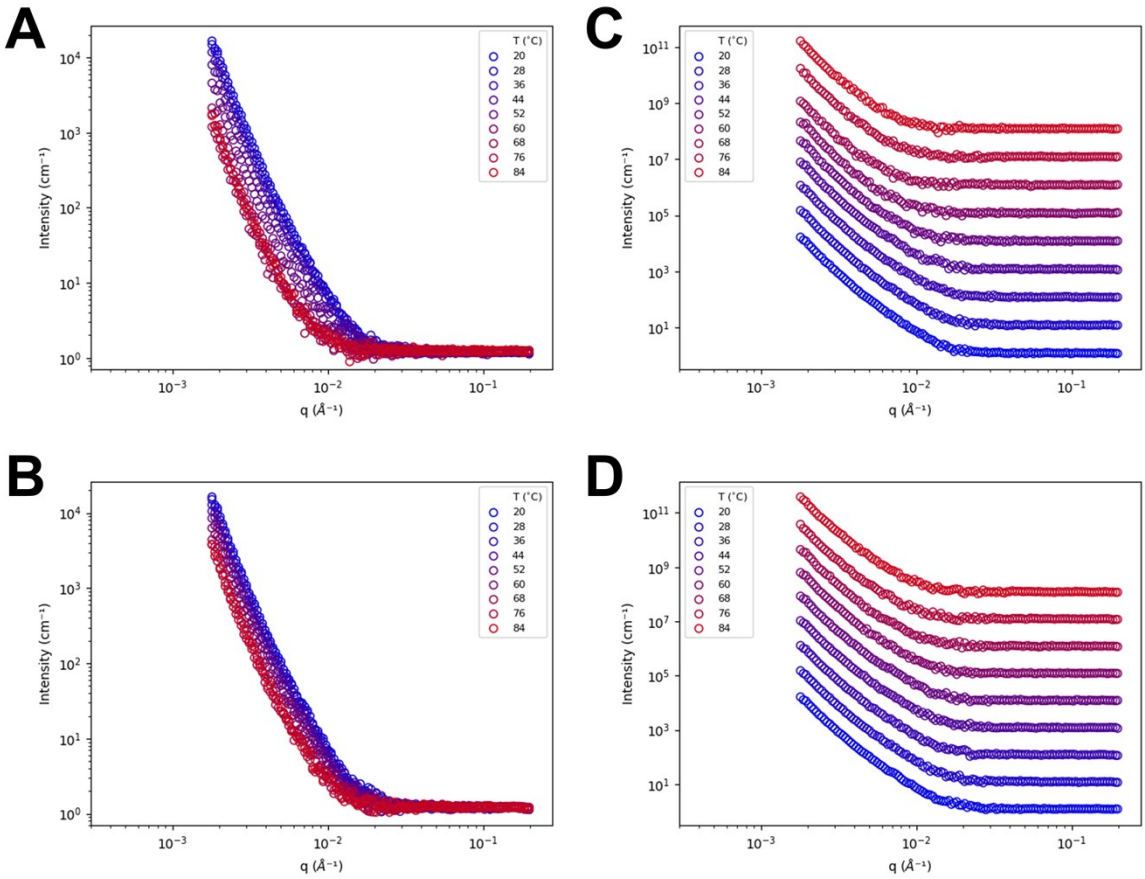

Figure S3. 2D plots of the SANS spectra of samples 2H (**A**) and 4H (**B**) in bubble- matched medium (9% D_2O/ 91% H_2O). **C** and **D** shows **A** and **B**, respectively, with vertical offset (10× original scattering intensity per temperature increment). Scattering intensities in 9% D_2O/ 91% H_2O arise mainly from emulsion droplets.

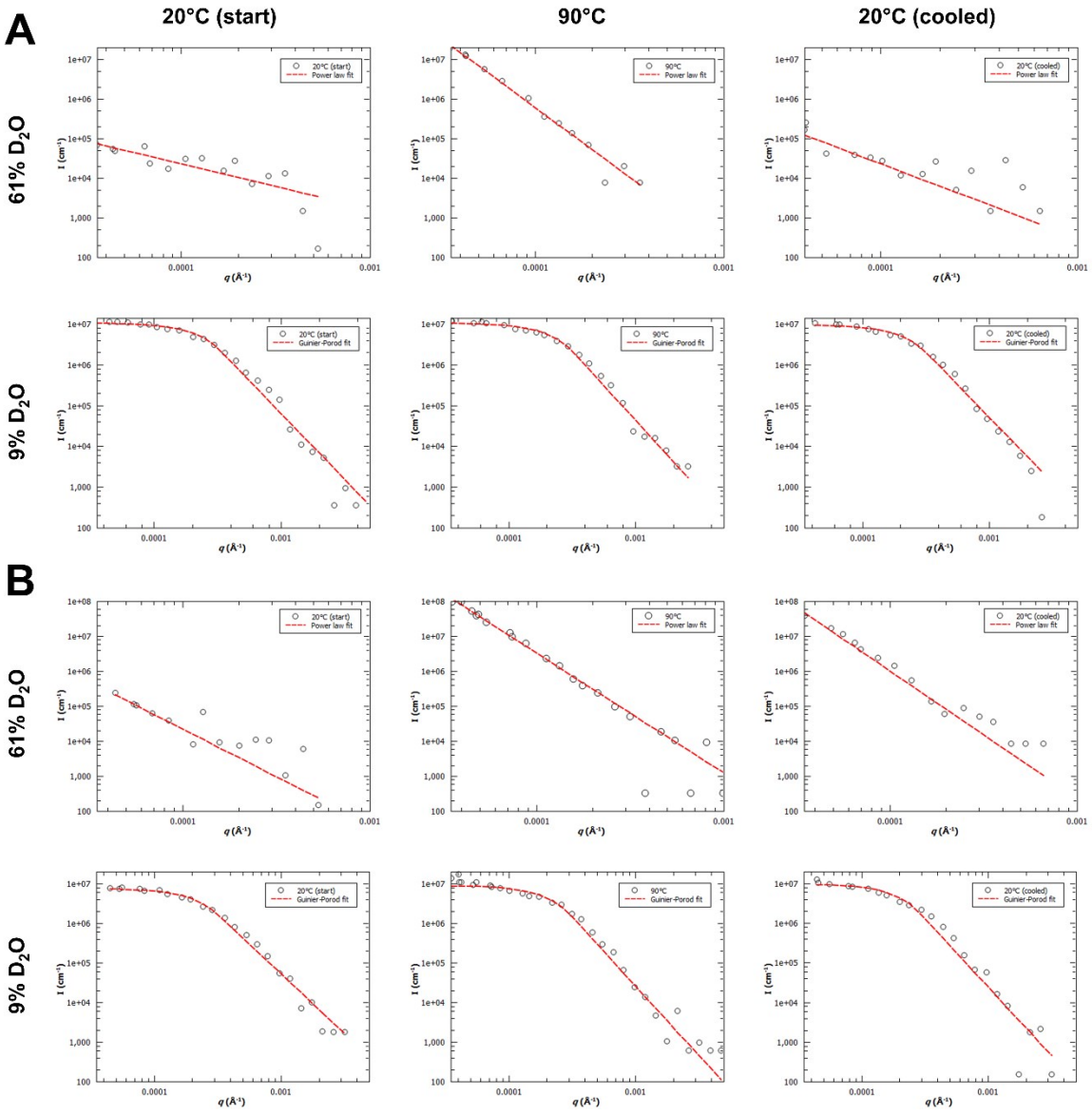

Figure S4. Scatter plots and model fitting (red line) of the USANS spectra of PDA/PFH emulsions (polymerisation times = 2 hours (**A**) and 4 hours (**B**)) in different contrast-matched dispersing media at 20°C, 90°C, and 20°C (after cooling from 90°C). Scattering intensities in 61% D_2O/ 39% H_2O and in 9% D_2O/ 91% H_2O arise from microbubbles and emulsion droplets, respectively.

Table S1. Power-law exponents calculated from SANS spectra of emulsion samples in bubble-matched media (9% D_2O/ 91% H_2O).

Temperature (°C)	Power-law exponent	
	Sample 2H	**Sample 4H**
20	4.00 ± 0.01	4.00 ± 0.02
30	4.00 ± 0.01	4.00 ± 0.02
40	4.00 ± 0.01	4.00 ± 0.01
50	4.00 ± 0.01	4.00 ± 0.01
60	4.00 ± 0.01	4.00 ± 0.01
70	4.00 ± 0.02	4.00 ± 0.01
80	4.00 ± 0.02	4.00 ± 0.03
90	4.00 ± 0.02	4.00 ± 0.02