Supporting Information

Confined Bicontinuous Microemulsions: Nanoscale Dynamics of the Surfactant Film

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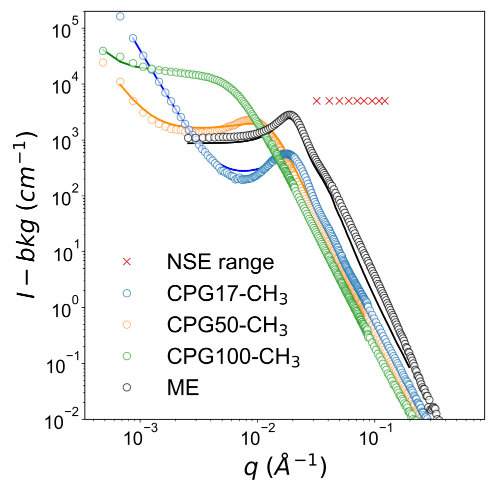

Fig. S 1 SANS signal of the air-filled hydrophobic CPG and the bicontinuous microemulsion in bulk (ME). The red crosses represent the investigated q-range by NSE.

Table S 1 Fit Parameters of the intermediate scattering function of the microemulsion in bulk

q (1/Å)	Γ_c ($\times 10^3$/ns)	Γ_z (1/ns)	A
0.032	1.38±0.07	0.04±0.01	0.17±0.02
0.041	1.78±0.07	0.04±0.01	0.21±0.02
0.050	2.29±0.12	0.04±0.01	0.29±0.02
0.060	4.62±0.20	0.08±0.01	0.26±0.02
0.071	5.84±0.31	0.09±0.01	0.36±0.03
0.081	8.38±0.47	0.12±0.01	0.39±0.03
0.095	15.57±0.54	0.17±0.01	0.47±0.02
0.109	20.63±1.18	0.21±0.01	0.54±0.03
0.122	32.38±3.85	0.27±0.05	0.50±0.07

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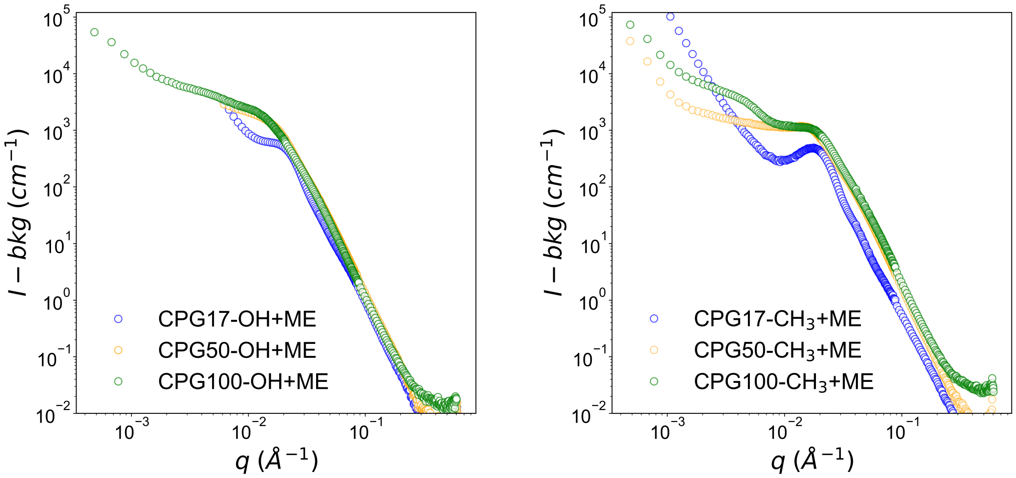

Fig. S 2 SANS signal of the CPG imbibed with the microemulsion, left hydrophilic CPG and right hydrophobic CPG.

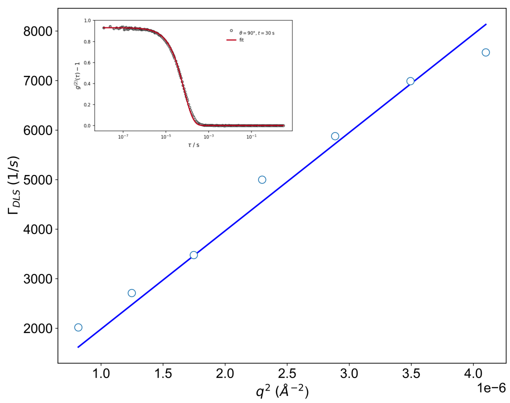

Fig. S 3 Decay rate Γ_{DLS} in dependence of q^2, the slope (solid line) determines the diffusion coefficient. Inset: The intensity-autocorrelation function at a scattering angle of 90 °. Uncertainties are within the symbols.

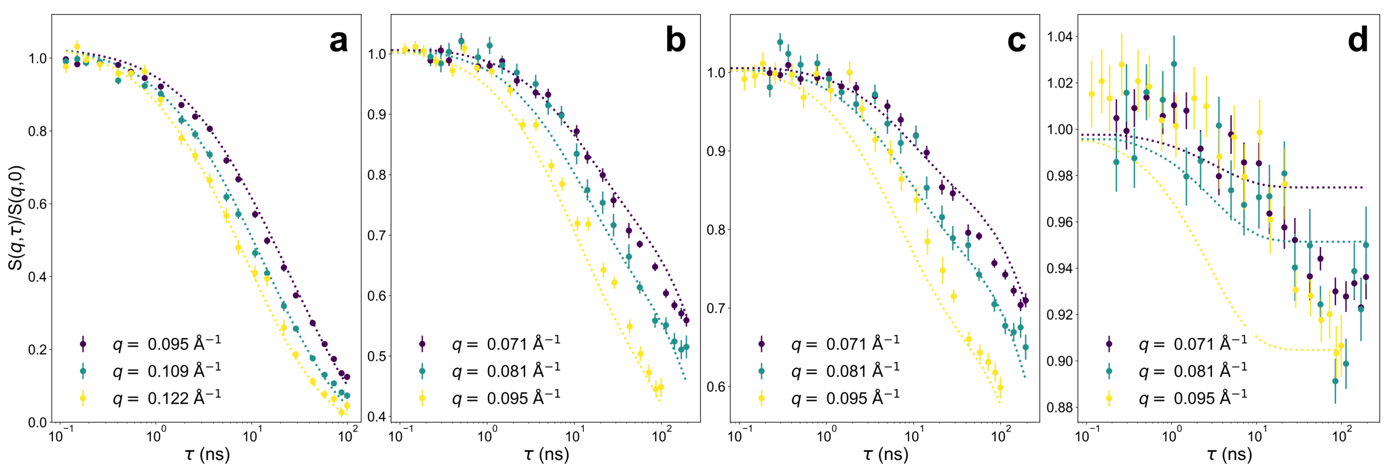

Fig. S 4 Normalized intermediate scattering functions of the confined microemulsion in the hydrophilic CPG100-OH (a), CPG-50-OH (b) and CPG17-OH (c) for several q values and the fit to the Eq. 9.

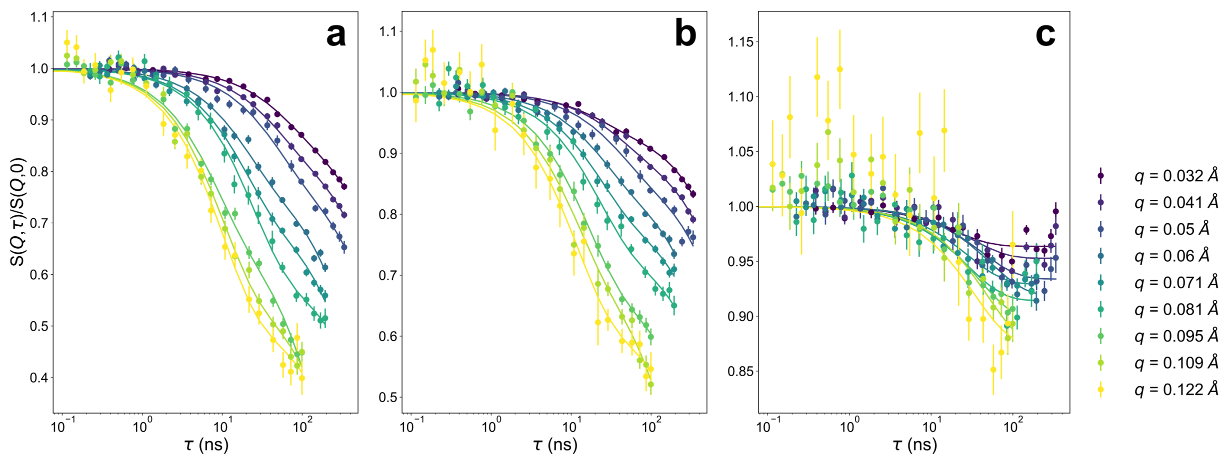

Fig. S 5 Normalized intermediate scattering function of the confined microemulsion in the hydrophilic CPG100-OH (a), CPG50-OH (b) and CPG17-OH.

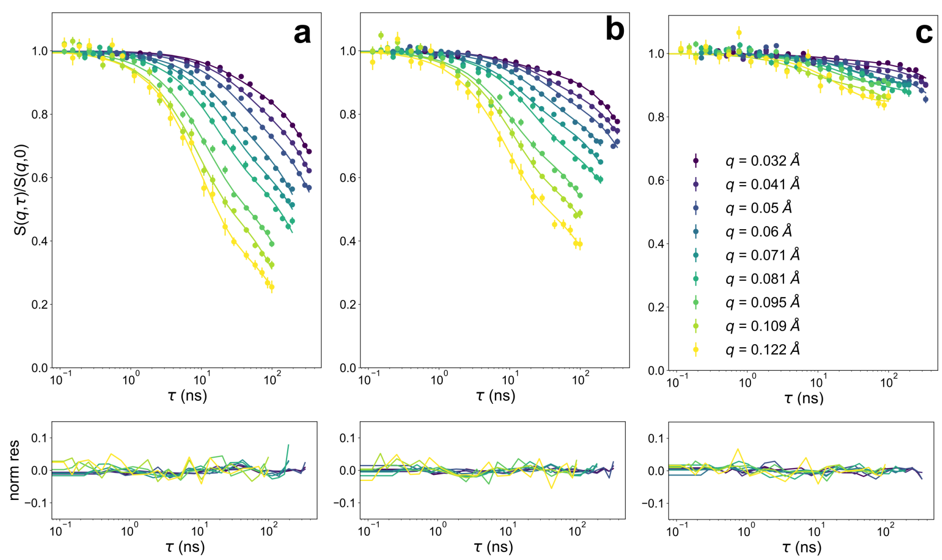

Fig. S 6 Normalized intermediate scattering functions of the confined microemulsion in the hydrophobic CPG100-CH_3 (a), CPG50-CH_3 (b) and CPG17-CH_3 (c) for several q values. Bottom: normalized residuals of the fit.

Table S 2 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophilic CPG17-OH

q (1/Å)	A	Γ_c (1/ns) [a]	Γ_z (1/ns)
0.032	0.04±0.01	2.1e-24±0.001	0.074±0.036
0.041	0.05±0.02	2.8e-60±0.001	0.048±0.027
0.050	0.07±0.02	4.4e-20±0.001	0.036±0.015
0.060	0.08±0.05	4.4e-22±0.001	0.028±0.160
0.071	0.07±0.02	1.4e-21±0.001	0.053±0.018
0.081	0.09±0.04	8.9e-24±0.001	0.053±0.035
0.095	0.10±0.18	1.2e-15±0.002	0.040±0.058
0.109	0.13±0.59	4.5e-18±0.004	0.031±0.101
0.122	0.13±0.57	3.8e-19±0.006	0.044±0.177

[a] approx. 0, the contribution of Γ_c to the intermediate scattering function is negligible.

Table S 3 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophobic CPG17-CH_3

q (1/Å)	A	Γ_c (1/ns) [a]	Γ_z (1/ns)
0.032	0.02±0.01	1.9e-04±0.001	0.144±0.124
0.041	0.03±0.01	2.0e-04±0.001	0.109±0.058
0.050	0.05±0.02	2.5e-04±0.001	0.061±0.037
0.060	0.08±0.02	1.1e-04±0.001	0.051±0.016
0.071	0.07±0.02	1.6e-04±0.001	0.056±0.015
0.081	0.09±0.03	1.7e-04±0.001	0.063±0.027
0.095	0.09±0.04	2.6e-20±0.002	0.091±0.041
0.109	0.08±0.01	7.2e-04±0.004	0.220±0.051
0.122	0.15±0.07	6.3e-10±0.006	0.079±0.043

[a] approx. 0, the contribution of Γ_c o the intermediate scattering function is negligible.

Table S 4 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophilic CPG50-OH

q (1/Å)	A	Γ_c (1/ns)	Γ_z (1/ns)
0.032	0.06±0.01	0.0003±0.0001	0.066±0.009
0.041	0.09±0.01	0.0004±0.0001	0.021±0.006
0.050	0.13±0.03	0.0004±0.0002	0.039±0.010
0.060	0.14±0.02	0.0007±0.0002	0.062±0.009
0.071	0.20±0.01	0.0007±0.0001	0.068±0.006
0.081	0.25±0.03	0.0007±0.0003	0.069±0.013
0.095	0.31±0.03	0.0013±0.0006	0.095±0.012
0.109	0.28±0.04	0.0032±0.0007	0.135±0.030
0.122	0.37±0.05	0.0015±0.0001	0.131±0.028

Table S 5 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophobic CPG50-CH_3

q (1/Å)	A	Γ_c (1/ns)	Γ_z (1/ns)
0.032	0.06±0.01	0.0006±0.0001	0.128±0.023
0.041	0.10±0.01	0.0006±0.0001	0.056±0.008
0.050	0.13±0.02	0.0007±0.0001	0.051±0.008
0.060	0.16±0.02	0.0009±0.0001	0.066±0.007
0.071	0.19±0.01	0.0012±0.0001	0.095±0.010
0.081	0.26±0.02	0.0012±0.0002	0.080±0.009
0.095	0.29±0.02	0.0028±0.0005	0.154±0.019
0.109	0.37±0.03	0.0029±0.0006	0.142±0.018
0.122	0.44±0.03	0.0038±0.0008	0.168±0.019

Table S 6 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophilic CPG100-OH

q (1/Å)	A	Γ_c (1/ns)	Γ_z (1/ns)
0.032	0.12±0.02	0.0004±0.0001	0.024±0.003
0.041	0.15±0.02	0.0005±0.0001	0.031±0.004
0.050	0.20±0.03	0.0006±0.0002	0.032±0.006
0.060	0.21±0.02	0.0014±0.0002	0.076±0.011
0.071	0.28±0.02	0.0015±0.0002	0.079±0.008
0.081	0.39±0.03	0.0010±0.0004	0.063±0.007
0.095	0.30±0.03	0.0051±0.0007	0.183±0.025
0.109	0.42±0.04	0.0031±0.0011	0.149±0.021
0.122	0.48±0.05	0.0024±0.0014	0.149±0.022

Table S 7 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophobic CPG100-CH_3

q (1/Å)	A	Γ_c (1/ns)	Γ_z (1/ns)
0.032	0.09±0.01	0.0009±0.0001	0.055±0.010
0.041	0.15±0.02	0.0010±0.0001	0.040±0.005
0.050	0.20±0.02	0.0011±0.00001	0.046±0.006
0.060	0.22±0.02	0.0018±0.0002	0.071±0.008
0.071	0.30±0.02	0.0017±0.0002	0.072±0.007
0.081	0.33±0.02	0.0023±0.0003	0.092±0.009
0.095	0.40±0.02	0.0041±0.0006	0.136±0.011
0.109	0.44±0.03	0.0059±0.0007	0.178±0.018
0.122	0.56±0.03	0.0055±0.0011	0.152±0.014

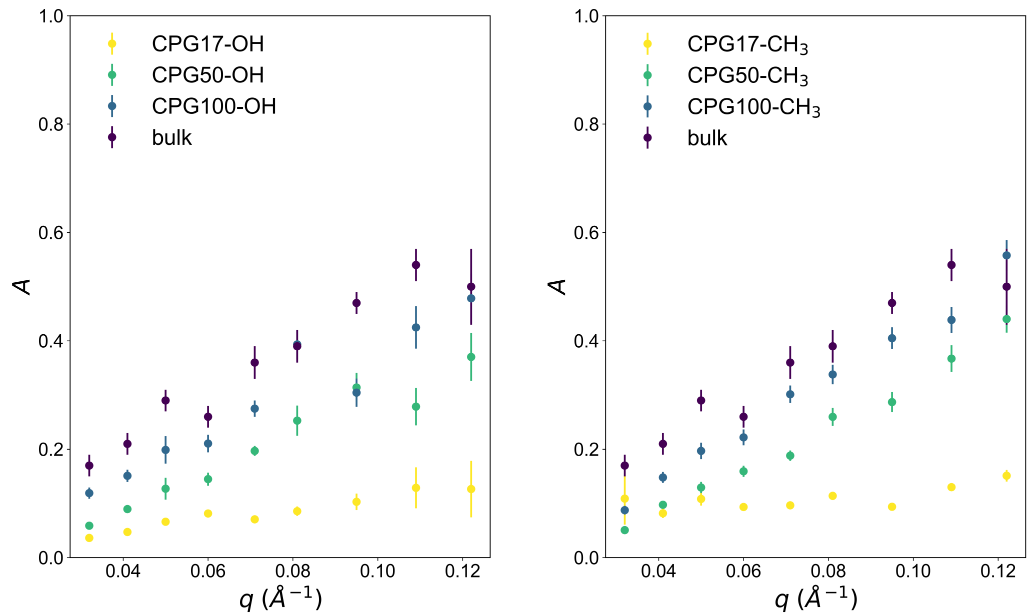

Fig. S 7 Amplitudes $A(q)$ of the Zilman-Granek contribution to the fitting model given in Eq. 7 in the main paper. For CPG17 the relaxation rate of the concentration fluctuations was fixed in Eq. 7 at $\Gamma_c = 0$. The plot on the left side shows $A(q)$ for the hydrophilic pore surfaces and the right side plot shows $A(q)$ for the hydrophobized pore surfaces.

Table S 8 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophilic CPG17-OH, using Eq.7 neglecting the contributions of the concentration fluctuations ($\Gamma_c = 0$)

q (1/Å)	A	Γ_z (1/ns)
0.032	0.04±0.01	0.074±0.027
0.041	0.05±0.01	0.048±0.019
0.050	0.07±0.01	0.036±0.009
0.060	0.08±0.01	0.028±0.005
0.071	0.07±0.01	0.053±0.010
0.081	0.09±0.01	0.053±0.019
0.095	0.10±0.02	0.040±0.014
0.109	0.13±0.04	0.031±0.018
0.122	0.13±0.05	0.044±0.040

Table S 9 Fit Parameters of the intermediate scattering function of the microemulsion inside the hydrophobic CPG17-CH_3, using Eq.7 neglecting the contributions of the concentration fluctuations ($\Gamma_c = 0$)

q (1/Å)	A	Γ_z (1/ns)
0.032	0.20±0.05	0.005±0.003
0.041	0.08±0.01	0.016±0.004
0.050	0.11±0.02	0.017±0.005
0.060	0.09±0.01	0.040±0.006
0.071	0.10±0.02	0.040±0.005
0.081	0.11±0.01	0.047±0.011
0.095	0.09±0.01	0.091±0.020
0.109	0.13±0.01	0.092±0.014
0.122	0.15±0.02	0.079±0.019