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APPENDICES

Appendix A Surface Tension of Surfactant Solutions

Table A1 Surface tension of cationic surfactant solutions

Initial surfactant concentration (μM)			Surface tension* (mN/m)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	69.40	70.39	71.89
100	400	400	68.60	68.36	71.43
200	600	600	61.90	64.57	70.81
300	800	800	56.11	60.43	70.56
400	900	1,000	52.33	58.11	69.45
500	1,000	2,000	49.47	56.77	65.74
600	2,000	4,000	45.53	47.37	57.84
700	3,000	6,000	43.51	40.65	51.46
800	4,000	8,000	41.06	37.32	46.84
900	5,000	10,000	38.34	36.69	43.62
1,000	6,000	12,000	37.01	37.33	39.67
2,000	7,000	14,000	36.59	36.86	37.60
3,000	8,000	15,000	35.70	35.99	37.54
4,000	9,000	16,000	35.98	36.60	37.39
5,000	10,000	17,000	35.79	36.60	37.94
6,000	12,000	18,000	35.52	36.76	37.38
7,000	14,000	20,000	35.57	36.89	37.75
10,000	25,000	25,000	35.83	35.61	37.61

***Note** Surface tension of water is 72.84 mN/m.

Table A2 Surface tension of anionic surfactant solutions

Initial surfactant concentration (μM)			Surface tension* (mN/m)		
SDS	SOBS	C8	SDS	SOBS	C8
105	200	2,500	72.10	72.78	71.90
175	400	4,000	71.46	72.75	71.69
200	600	5,000	71.40	72.23	71.25
350	800	6,000	71.13	72.22	70.85
400	1,000	8,000	70.90	71.46	70.33
525	1,200	10,000	70.27	71.12	69.97
600	1,400	20,000	70.00	70.37	65.33
700	1,600	40,000	69.40	68.76	58.96
800	1,800	60,000	68.40	67.15	52.06
875	2,000	80,000	67.18	65.30	47.88
1,000	4,000	100,000	65.40	57.46	44.82
1,750	6,000	150,000	60.31	52.65	38.02
2,000	8,000	200,000	58.50	48.22	32.91
4,000	10,000	250,000	48.00	44.60	28.90
3,500	12,000	300,000	50.19	42.11	26.30
5,000	14,000	350,000	44.46	42.70	26.41
6,000	16,000	370,000	40.77	42.43	26.31
7,000	18,000	400,000	37.31	42.20	25.96
8,000	20,000		35.27	42.25	
8,750	30,000		35.27	42.64	
9,000			34.96		
12,000			34.59		
14,000			34.51		
16,000			33.83		
25,000			34.20		

*Note Surface tension of water is 72.84 mN/m.

Table A3 Surface tension of surfactant solutions at pH 3 and 9

Initial surfactant concentration(μM)		Surface tension* (mN/m)			
CTAB	SDS	CTAB		SDS	
		pH 3	pH 9	pH 3	pH 9
80	200	58.99	60.52	71.45	70.67
100	400	56.00	59.42	68.87	69.43
200	600	51.45	55.82	67.64	69.37
300	800	47.42	50.11	64.37	66.88
400	1,000	42.49	47.10	62.20	65.36
500	2,000	41.38	44.65	57.71	59.15
600	4,000	39.58	44.46	48.64	50.61
700	5,000	37.16	41.11	45.12	45.37
800	6,000	36.58	39.25	41.88	42.37
900	7,000	36.96	38.22	38.79	37.15
1,000	8,000	36.22	37.68	38.17	36.48
2,000	9,000	35.66	37.19	38.19	37.18
3,000	10,000	36.08	36.58	38.07	38.07
4,000	12,000	36.29	36.85	38.04	38.22
5,000	14,000	35.98	36.89	37.42	37.30
6,000	16,000	35.99	36.15	37.87	37.87
7,000	18,000	35.72	35.77	37.12	37.17
	25,000			37.53	37.15

*Note Surface tension of water at pH 3 and 9 are 72.87 and 72.80 mN/m.

Appendix B Contact Angle of Surfactant Solutions

Table B1 Contact angle of CTAB solutions

Initial CTAB concentration (μM)	Contact Angle of surfactant solution ($^{\circ}$)							
	PTFE	HDPE	PC	PVC	ABS	PMMA	PA66	PCL
Water	103.0	91.77	89.23	85.29	84.44	82.71	80.52	75.61
80	100.4	89.50	87.57	79.25	83.23	81.70	75.25	74.37
100	98.10	87.76	87.33	78.20	81.58	78.79	74.59	74.04
200	93.07	84.16	81.19	76.36	80.61	77.05	72.67	73.15
300	89.52	79.12	76.80	74.46	79.52	75.33	69.65	72.73
400	85.83	78.43	73.60	70.31	78.56	73.40	67.83	70.13
500	83.74	74.23	67.50	67.97	77.74	69.30	62.88	65.03
600	82.40	71.72	65.17	63.77	75.17	63.58	59.09	61.78
700	78.16	71.28	60.57	59.57	71.21	60.20	53.53	58.22
800	77.16	67.72	56.65	57.62	68.61	56.95	50.71	54.55
900	75.33	64.38	54.31	54.80	61.90	52.92	47.37	53.76
1,000	74.70	61.12	51.86	55.77	53.12	52.07	44.94	50.13
2,000	72.73	58.75	51.70	54.10	53.67	50.92	42.71	48.90
3,000	72.44	55.77	51.90	53.60	51.56	51.52	43.25	47.38
4,000	71.90	56.01	51.27	54.30	51.80	51.13	42.50	47.00
5,000	71.87	56.02	51.68	53.18	52.58	51.28	43.90	47.18
6,000	72.07	56.10	52.14	53.55	52.75	50.91	40.88	47.18
7,000	71.58	56.46	51.64	54.23	51.20	50.56	42.85	45.50
10,000	-	55.31	51.35	53.27	51.74	50.72	41.49	-

Table B2 Contact angle of TTAB solutions

Initial TTAB concentration (μM)	Contact Angle of surfactant solution ($^{\circ}$)							
	PTFE	HDPE	PC	PVC	ABS	PMMA	PA66	PCL
Water	103.0	91.77	89.23	85.29	84.44	82.71	80.52	75.61
200	97.68	89.13	85.53	83.88	84.37	75.83	76.53	75.75
400	92.55	88.87	84.87	83.44	83.84	73.94	76.67	74.98
600	90.15	88.35	83.17	81.51	82.02	73.31	75.67	74.56
800	88.38	85.54	79.25	81.28	81.74	74.55	72.43	73.98
900	88.40	84.66	76.48	79.25	79.44	74.38	70.61	73.18
1,000	86.98	83.22	72.68	78.51	77.75	73.37	69.81	72.32
2,000	84.58	82.97	68.97	74.20	69.19	68.10	60.12	63.20
3,000	79.01	67.66	65.46	71.88	61.34	65.48	52.45	53.75
4,000	77.88	67.01	58.80	58.04	58.47	59.83	48.85	46.73
5,000	73.94	65.16	57.92	58.16	58.51	58.37	48.75	47.20
6,000	74.26	64.18	53.59	58.06	58.30	57.41	48.32	46.13
7,000	74.71	57.45	53.37	53.93	58.97	57.30	46.73	45.15
8,000	74.78	57.79	53.05	52.92	58.81	57.79	46.99	44.82
9,000	74.34	57.78	53.74	52.78	58.85	57.71	46.74	45.65
10,000	74.13	57.83	53.71	52.17	58.18	57.60	46.16	44.67
12,000	74.80	57.72	53.54	52.47	57.77	57.18	46.89	44.53
14,000	74.06	57.55	53.65	51.90	56.31	57.76	46.01	44.20
25,000	-	57.36	53.58	47.74	51.48	57.35	46.53	44.90

Table B3 Contact angle of DTAB solutions

Initial DTAB concentration (μM)	Contact Angle of surfactant solution ($^{\circ}$)							
	PTFE	HDPE	PC	PVC	ABS	PMMA	PA66	PCL
Water	103.0	91.77	89.23	85.29	84.44	82.71	80.52	75.61
200	102.3	91.72	85.55	85.23	81.49	82.37	79.22	75.15
400	101.0	91.32	84.67	84.72	81.30	82.18	78.40	74.68
600	97.95	89.63	84.42	81.94	80.45	79.33	76.48	74.50
800	95.99	89.36	81.52	80.27	78.39	77.41	76.39	74.26
1,000	91.68	88.72	80.11	78.25	75.25	76.59	75.60	73.86
2,000	91.39	87.17	77.80	77.04	74.45	76.02	74.58	73.28
4,000	89.06	86.04	73.97	72.23	73.51	74.90	69.81	72.21
6,000	86.81	82.99	73.88	72.19	69.37	68.22	64.83	69.41
8,000	84.76	80.70	68.79	69.51	63.64	62.14	60.54	61.80
10,000	82.83	77.29	56.72	66.42	60.85	56.49	51.81	57.28
12,000	79.64	71.15	48.71	56.74	49.57	44.29	48.85	44.88
14,000	78.24	68.45	48.21	47.41	49.20	42.75	40.24	44.55
15,000	75.73	64.73	48.41	47.44	47.44	41.02	38.18	44.40
16,000	75.95	60.10	48.16	47.00	47.71	41.33	38.24	43.54
17,000	76.85	58.34	46.33	47.36	47.23	41.74	38.18	43.22
18,000	75.66	58.27	45.50	47.33	47.54	41.69	38.25	43.23
20,000	75.48	58.37	44.61	46.30	47.56	41.69	38.87	43.18
25,000	-	58.36	44.77	46.24	47.51	41.67	38.76	43.77

Table B5 Contact angle of SOBS solutions

Initial SOBS concentration (μM)	Contact Angle of surfactant solution ($^{\circ}$)							
	PTFE	HDPE	PC	PVC	ABS	PMMA	PA66	PCL
Water	103.0	91.77	89.23	85.29	84.44	82.71	80.52	75.61
200	100.4	85.60	84.50	80.50	85.90	79.40	78.50	75.39
400	99.60	84.40	84.60	80.30	83.20	78.90	78.20	74.56
600	98.50	84.00	83.80	80.00	82.30	78.40	76.50	73.97
800	98.40	82.60	82.90	79.90	81.30	77.70	75.10	73.47
1,000	98.30	81.50	81.30	79.90	80.90	76.10	74.60	73.37
1,200	-	-	-	-	-	-	-	73.36
1,400	98.20	80.90	80.60	79.90	80.90	76.00	73.80	-
1,600	-	-	-	-	-	-	-	73.17
1,800	97.10	80.70	79.50	78.80	80.50	75.90	73.00	-
2,000	95.50	80.30	77.80	78.60	79.50	75.80	71.50	72.64
4,000	93.30	75.80	77.70	77.60	78.80	75.70	70.90	72.25
6,000	88.60	73.80	75.80	75.30	76.50	70.90	69.10	67.62
8,000	85.00	69.20	68.80	71.50	73.30	66.90	60.40	64.83
10,000	84.10	67.90	63.00	66.40	69.40	59.30	57.00	56.98
12,000	79.20	64.10	61.90	62.80	65.40	57.10	56.80	54.88
14,000	79.20	63.80	59.10	61.60	66.10	57.10	56.00	53.24
16,000	79.20	63.50	59.80	61.50	66.30	57.20	55.40	52.85
18,000	79.30	63.40	59.30	61.60	66.30	57.20	54.80	53.60
20,000	79.40	63.10	59.00	61.40	65.90	57.40	54.20	53.20
30,000	79.10	62.80	59.45	61.50	66.10	57.20	54.40	53.82

Table B7 Contact angle (CA) of surfactant solutions at pH 3 and 9

Initial [CTAB] (μM)	CA of CTAB solution ($^{\circ}$)				Initial [SDS] (μM)	CA of SDS solution ($^{\circ}$)			
	PTFE		PVC			PTFE		PVC	
	pH 3	pH 9	pH 3	pH 9		pH 3	pH 9	pH 3	pH 9
Water	103.0	103.0	85.10	85.40	Water	103.0	103.0	85.10	85.40
80	89.36	101.9	81.08	78.30	200	100.8	100.5	82.00	80.07
100	88.15	94.26	77.98	78.00	400	98.27	99.50	78.51	79.00
200	85.00	92.13	75.18	75.52	600	95.60	98.40	76.56	77.83
300	82.20	86.93	72.80	72.13	800	93.58	95.62	74.17	76.54
400	81.46	83.53	67.84	69.30	1,000	93.04	94.90	73.45	73.53
500	80.16	81.77	64.72	66.76	2,000	91.67	92.12	70.83	70.60
600	77.45	81.17	60.40	65.55	4,000	88.42	88.62	67.22	68.53
700	75.60	78.50	56.58	61.33	5,000	84.60	86.27	63.55	65.03
800	74.78	76.89	56.10	57.75	6,000	79.46	80.62	58.39	60.56
900	73.95	75.90	55.58	55.05	7,000	78.96	79.73	54.93	54.28
1,000	73.21	74.12	55.42	55.78	8,000	77.50	79.95	54.88	52.78
2,000	73.23	72.72	55.40	54.88	9,000	77.38	76.47	54.40	53.98
3,000	73.15	71.80	54.68	55.52	10,000	76.50	79.53	53.30	56.26
4,000	71.65	71.56	54.44	55.30	12,000	76.72	78.90	53.82	53.53
5,000	71.10	72.30	54.73	55.09	14,000	77.50	78.00	54.18	54.87
6,000	71.70	72.12	55.56	55.24	16,000	76.18	75.90	55.88	53.10
7,000	72.44	72.13	54.55	55.25	18,000	75.93	77.16	54.37	53.88
					25,000	75.42	77.41	54.68	53.45

*Note [CTAB] and [SDS] stand for CTAB and SDS concentration.

Appendix C Adsorption Isotherm of Surfactant Solutions

Table C1 Adsorption isotherm of cationic surfactant solutions on PTFE

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PTFE)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	50.08	177.96	186.14	0.197	0.372	0.234
100	400	400	64.41	373.76	381.86	0.222	0.445	0.307
200	600	600	144.10	566.91	579.87	0.374	0.560	0.341
300	800	800	221.18	762.10	774.20	0.528	0.642	0.436
400	900	1,000	308.33	858.26	971.76	0.580	0.706	0.478
500	1,000	2,000	390.06	953.21	1965.05	0.702	0.793	0.593
600	2,000	4,000	443.65	1923.85	3956.72	1.046	1.292	0.732
700	3,000	6,000	525.11	2910.79	5937.79	1.156	1.511	1.052
800	4,000	8,000	590.08	3908.73	7913.33	1.360	1.547	1.469
900	5,000	10,000	669.19	4907.90	9898.09	1.533	1.558	1.723
1,000	6,000	12,000	748.93	5910.32	11878.24	1.680	1.521	2.059
2,000	7,000	14,000	1750.57	6908.68	13872.20	1.605	1.546	2.162
3,000	8,000	15,000	2751.64	7907.03	14866.88	1.587	1.572	2.256
4,000	9,000	16,000	3751.43	8909.45	15861.56	1.644	1.537	2.349
5,000	10,000	17,000	4756.77	9907.80	16860.85	1.606	1.560	2.354
6,000	12,000	18,000	5743.31	11908.58	17860.13	1.699	1.550	2.365
7,000	14,000	20,000	6739.93	13909.35	19858.70	1.692	1.534	2.389
		25,000			24859.73			2.374

Table C2 Adsorption isotherm of cationic surfactant solutions on HDPE

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ HDPE)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	67.29	141.69	165.64	0.057	0.261	0.154
100	400	400	81.65	317.59	350.73	0.082	0.370	0.221
200	600	600	160.64	498.28	536.80	0.177	0.456	0.283
300	800	800	242.46	682.09	729.84	0.258	0.529	0.315
400	900	1,000	317.13	767.00	902.40	0.372	0.597	0.438
500	1,000	2,000	396.07	848.22	1890.84	0.467	0.680	0.490
600	2,000	4,000	462.01	1759.83	3852.53	0.619	1.078	0.662
700	3,000	6,000	530.83	2734.73	5835.00	0.759	1.190	0.739
800	4,000	8,000	610.58	3703.90	7797.57	0.850	1.329	0.909
900	5,000	10,000	656.72	4702.99	9782.29	1.092	1.334	0.975
1,000	6,000	12,000	740.88	5709.08	11746.55	1.163	1.307	1.137
2,000	7,000	14,000	1725.21	6703.93	13717.77	1.233	1.329	1.266
3,000	8,000	15,000	2729.78	7704.91	14715.65	1.214	1.324	1.276
4,000	9,000	16,000	3720.86	8706.93	15713.96	1.253	1.317	1.286
5,000	10,000	17,000	4730.84	9708.31	16699.10	1.208	1.310	1.348
6,000	12,000	18,000	5712.01	11703.74	17700.36	1.293	1.327	1.345
7,000	14,000	20,000	6715.69	13706.45	19702.55	1.275	1.317	1.334
10,000	25,000	25,000	9717.73	24703.02	24702.29	1.267	1.332	1.337

Table C3 Adsorption isotherm of cationic surfactant solutions on PC

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PC)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	38.45	144.72	159.30	0.590	0.787	0.580
100	400	400	56.00	322.97	337.41	0.627	1.098	0.892
200	600	600	136.79	505.81	532.30	0.899	1.342	0.965
300	800	800	218.26	704.93	707.71	1.163	1.355	1.316
400	900	1,000	289.32	803.53	890.67	1.574	1.373	1.556
500	1,000	2,000	387.31	886.18	1879.17	1.604	1.622	1.721
600	2,000	4,000	462.92	1834.94	3815.86	1.950	2.351	2.623
700	3,000	6,000	525.93	2791.91	5772.54	2.473	2.962	3.236
800	4,000	8,000	604.69	3755.17	7753.35	2.779	3.490	3.509
900	5,000	10,000	662.75	4762.41	9722.89	3.372	3.382	3.946
1,000	6,000	12,000	755.02	5761.43	11710.12	3.483	3.400	4.128
2,000	7,000	14,000	1742.95	6752.23	13697.59	3.660	3.527	4.304
3,000	8,000	15,000	2750.23	7757.54	14684.20	3.557	3.451	4.493
4,000	9,000	16,000	3748.05	8758.01	15657.33	3.590	3.442	4.881
5,000	10,000	17,000	4735.08	9758.48	16664.85	3.769	3.440	4.774
6,000	12,000	18,000	5743.26	11802.93	17662.99	3.654	3.419	4.807
7,000	14,000	20,000	6746.94	13750.71	19665.45	3.601	3.551	4.760
10,000	25,000	25,000	9748.97	24751.07	24658.67	3.567	3.543	4.856

Table C4 Adsorption isotherm of cationic surfactant solutions on PVC

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PVC)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	45.45	135.46	170.97	0.642	1.209	0.543
100	400	400	58.36	334.98	343.89	0.780	1.217	1.050
200	600	600	127.68	530.14	537.79	1.354	1.309	1.165
300	800	800	231.51	724.92	724.55	1.276	1.406	1.413
400	900	1,000	311.76	815.30	900.41	1.644	1.584	1.865
500	1,000	2,000	388.50	902.30	1867.90	2.079	1.827	2.470
600	2,000	4,000	441.34	1856.37	3850.79	2.965	2.685	2.795
700	3,000	6,000	529.69	2794.98	5793.91	3.172	3.840	3.854
800	4,000	8,000	621.05	3781.92	7750.43	3.342	4.080	4.667
900	5,000	10,000	702.07	4782.87	9748.09	3.691	4.057	4.716
1,000	6,000	12,000	797.94	5780.93	11723.25	3.782	4.103	5.177
2,000	7,000	14,000	1776.86	6786.24	13718.99	4.178	4.004	5.255
3,000	8,000	15,000	2785.94	7554.71	14711.50	4.008	4.109	5.397
4,000	9,000	16,000	3776.11	8782.35	15710.18	4.187	4.072	5.429
5,000	10,000	17,000	4775.74	9782.82	16707.67	4.180	4.055	5.475
6,000	12,000	18,000	5779.42	11783.76	17710.38	4.125	4.050	5.423
7,000	14,000	20,000	6778.60	13784.71	19707.37	4.142	4.020	5.481
10,000	25,000	25,000	9780.63	24785.07	24707.53	4.096	4.019	5.478

Table C5 Adsorption isotherm of cationic surfactant solutions on ABS

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ ABS)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	32.12	147.18	160.91	0.395	0.436	0.322
100	400	400	39.68	319.97	337.34	0.498	0.660	0.517
200	600	600	120.47	505.66	522.09	0.656	0.777	0.644
300	800	800	212.87	704.31	704.82	0.719	0.789	0.786
400	900	1,000	296.99	790.34	897.65	0.850	0.905	0.844
500	1,000	2,000	379.49	887.00	1837.84	0.993	0.933	1.337
600	2,000	4,000	450.78	1852.67	3796.53	1.231	1.217	1.681
700	3,000	6,000	523.70	2815.93	5786.83	1.453	1.520	1.761
800	4,000	8,000	601.11	3778.22	7760.08	1.640	1.830	1.982
900	5,000	10,000	691.13	4777.07	9729.08	1.719	1.841	2.235
1,000	6,000	12,000	786.99	5775.13	11710.12	1.759	1.851	2.392
2,000	7,000	14,000	1781.22	6775.60	13696.04	1.804	1.849	2.511
3,000	8,000	15,000	2775.45	7776.08	14681.01	1.853	1.847	2.633
4,000	9,000	16,000	3780.03	8776.55	15659.65	1.816	1.842	2.810
5,000	10,000	17,000	4771.55	9777.02	16645.51	1.885	1.838	2.926
6,000	12,000	18,000	5779.73	11777.96	17646.26	1.820	1.830	2.919
7,000	14,000	20,000	6778.91	13778.91	19648.36	1.825	1.822	2.900
10,000	25,000	25,000	9780.94	24779.27	24646.93	1.809	1.820	2.910

Table C6 Adsorption isotherm of cationic surfactant solutions on PMMA

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PMMA)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	42.58	151.14	165.69	0.402	0.524	0.369
100	400	400	51.62	337.26	346.55	0.519	0.673	0.574
200	600	600	144.70	525.66	532.28	0.594	0.798	0.728
300	800	800	241.69	710.77	722.46	0.625	0.957	0.834
400	900	1,000	328.38	813.24	894.00	0.769	0.932	1.139
500	1,000	2,000	402.77	902.65	1825.60	1.043	1.044	1.871
600	2,000	4,000	484.15	1861.56	3800.89	1.240	1.485	2.140
700	3,000	6,000	564.26	2831.10	5709.43	1.453	1.816	3.122
800	4,000	8,000	632.23	3785.17	7694.81	1.797	2.305	3.273
900	5,000	10,000	706.04	4767.09	9689.61	2.082	2.500	3.335
1,000	6,000	12,000	801.01	5766.11	11676.23	2.135	2.512	3.475
2,000	7,000	14,000	1787.13	6766.58	13671.55	2.284	2.505	3.529
3,000	8,000	15,000	2780.46	7767.06	14649.95	2.356	2.500	3.757
4,000	9,000	16,000	3787.29	8762.70	15631.96	2.280	2.545	3.947
5,000	10,000	17,000	4795.47	9768.00	16614.99	2.189	2.492	4.135
6,000	12,000	18,000	5785.64	11759.28	17612.57	2.302	2.582	4.155
7,000	14,000	20,000	6789.32	13760.22	19609.12	2.260	2.571	4.199
10,000	25,000	25,000	9795.85	24760.59	24618.24	2.189	2.574	4.099

Table C7 Adsorption isotherm of cationic surfactant solutions on PA66

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PA66)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	20.21	21.55	126.26	0.716	2.136	0.883
100	400	400	27.01	139.58	303.90	0.872	3.117	1.151
200	600	600	37.00	319.85	464.54	1.948	3.354	1.620
300	800	800	73.05	481.77	628.02	2.715	3.806	2.053
400	900	1,000	111.71	562.48	773.62	3.450	4.040	2.706
500	1,000	2,000	163.07	625.80	1640.44	4.028	4.479	4.300
600	2,000	4,000	210.73	1522.35	3437.67	4.657	5.712	6.730
700	3,000	6,000	248.54	2466.28	5371.61	5.401	6.380	7.527
800	4,000	8,000	276.44	3426.63	7303.60	6.254	6.862	8.331
900	5,000	10,000	291.25	4406.85	9310.65	7.280	7.105	8.247
1,000	6,000	12,000	378.79	5412.16	11258.90	7.423	7.035	8.863
2,000	7,000	14,000	1334.58	6412.63	13240.43	7.945	7.033	9.091
3,000	8,000	15,000	2344.56	7413.10	14234.12	7.832	7.024	9.148
4,000	9,000	16,000	3337.89	8418.41	15220.36	7.912	6.955	9.327
5,000	10,000	17,000	4331.66	9423.71	16179.00	7.980	6.894	9.822
6,000	12,000	18,000	5344.34	11414.99	17182.96	7.844	6.999	9.782
7,000	14,000	20,000	6339.02	13415.94	19187.65	7.904	6.985	9.707
10,000	25,000	25,000	9332.05	24406.63	24180.81	7.981	7.104	9.793

Table C8 Adsorption isotherm of cationic surfactant solutions on PCL

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PCL)		
CTAB	TTAB	DTAB	CTAB	TTAB	DTAB	CTAB	TTAB	DTAB
80	200	200	12.50	105.73	160.11	1.081	1.503	0.642
100	400	400	19.08	305.41	308.67	1.294	1.514	1.463
200	600	600	75.53	504.66	503.47	1.999	1.531	1.548
300	800	800	153.36	661.35	692.41	2.351	2.216	1.720
400	900	1,000	255.34	760.05	868.72	2.323	2.247	2.101
500	1,000	2,000	312.82	840.79	1773.71	3.003	2.545	3.623
600	2,000	4,000	415.24	1749.02	3757.12	2.966	4.033	3.890
700	3,000	6,000	491.98	2756.77	5718.84	3.336	3.877	4.500
800	4,000	8,000	589.42	3758.65	7716.50	3.374	3.886	4.544
900	5,000	10,000	675.39	4709.39	9695.71	3.603	4.671	4.870
1,000	6,000	12,000	725.95	5708.36	11673.89	4.394	4.690	5.233
2,000	7,000	14,000	1692.76	6706.21	13654.46	4.925	4.696	5.559
3,000	8,000	15,000	2698.38	7705.83	14645.92	4.829	4.715	5.666
4,000	9,000	16,000	3689.39	8713.23	15644.19	4.991	4.606	5.685
5,000	10,000	17,000	4698.54	9704.68	16647.43	4.836	4.738	5.667
6,000	12,000	18,000	5690.39	11706.18	17642.80	4.959	4.698	5.728
7,000	14,000	20,000	6687.59	13712.09	19643.28	5.014	4.598	5.729
	25,000	25,000		24715.17	24643.08		4.584	5.742

Table C9 Adsorption isotherm of anionic surfactant solutions on PTFE

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PTFE)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	75.23	186.80	3982.81	0.500	0.227	0.289
175	400	6000	125.89	381.00	5974.14	0.819	0.325	0.431
350	600	8000	302.50	574.60	7971.48	0.799	0.431	0.480
525	800	10000	479.58	769.47	9968.41	0.783	0.506	0.545
700	1000	20000	638.81	964.80	19943.92	1.075	0.608	0.986
875	1400	40000	809.84	1360.40	39922.09	1.130	0.669	1.351
1750	1800	60000	1669.01	1752.85	59854.23	1.322	0.763	2.380
3500	2000	80000	3411.83	1953.02	79820.60	1.525	0.764	3.103
5000	4000	100000	4903.48	3939.25	99739.24	1.679	1.020	4.536
6000	6000	150000	5883.83	5932.98	149669.34	1.947	1.152	5.541
7000	8000	200000	6882.82	7928.85	199656.40	1.931	1.216	5.662
8000	10000	250000	7879.35	9918.60	249677.31	2.010	1.338	5.375
8750	12000	300000	8638.27	11915.90	299685.17	1.884	1.379	5.309
9000	14000	350000	8881.69	13913.88	349696.12	1.976	1.411	5.074
12000	16000	370000	11888.38	15918.93	369704.87	1.953	1.418	5.164
14000	18000	400000	13882.57	17924.48	399684.53	1.936	1.322	5.202
16000	20000	450000	15887.84	19916.48	449709.81	1.939	1.386	5.017
	30000			29924.91			1.313	

Table C10 Adsorption isotherm of anionic surfactant solutions on HDPE

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ HDPE)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	64.39	181.53	3976.48	0.182	0.083	0.106
175	400	6000	109.76	361.77	5970.00	0.291	0.172	0.134
350	600	8000	247.40	540.07	7962.46	0.459	0.269	0.168
525	800	10000	418.00	725.96	9956.93	0.478	0.332	0.193
700	1000	20000	585.37	907.92	19935.04	0.514	0.414	0.291
875	1400	40000	754.35	1254.50	39892.41	0.539	0.654	0.483
1750	1800	60000	1617.77	1607.48	59809.27	0.591	0.864	0.856
3500	2000	80000	3355.20	1777.55	79772.90	0.650	0.999	1.017
5000	4000	100000	4828.53	3697.08	99733.99	0.765	1.359	1.195
6000	6000	150000	5827.59	5627.91	149618.03	0.771	1.670	1.711
7000	8000	200000	6822.73	7561.49	199522.01	0.795	1.974	2.144
8000	10000	250000	7815.50	9541.41	249551.16	0.823	2.054	2.013
8750	12000	300000	8568.87	11533.02	299520.90	0.812	2.093	2.153
9000	14000	350000	8819.63	13535.74	349542.65	0.809	2.081	2.055
12000	16000	370000	11817.05	15536.15	369548.75	0.817	2.077	2.022
14000	18000	400000	13818.23	17540.35	399551.09	0.815	2.064	2.016
16000	20000	450000	15815.86	19540.42	449521.62	0.825	2.056	2.146
	30000			29532.93			2.098	

Table C11 Adsorption isotherm of anionic surfactant solutions on PC

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PC)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	49.73	179.83	3978.62	0.780	0.287	0.305
175	400	6000	116.57	373.89	5968.01	0.825	0.371	0.456
350	600	8000	275.09	563.74	7961.83	1.065	0.516	0.544
525	800	10000	448.92	752.69	9954.86	1.073	0.675	0.644
700	1000	20000	619.91	951.55	19928.19	1.131	0.691	1.022
875	1400	40000	787.52	1335.19	39885.37	1.236	0.924	1.633
1750	1800	60000	1651.82	1722.44	59826.98	1.388	1.104	2.465
3500	2000	80000	3364.00	1924.19	79781.89	1.917	1.079	3.103
5000	4000	100000	4847.06	3875.29	99696.69	2.167	1.776	4.316
6000	6000	150000	5841.35	5863.24	149550.65	2.231	1.945	6.398
7000	8000	200000	6838.81	7773.56	199520.17	2.288	3.227	6.832
8000	10000	250000	7840.03	9760.82	249521.27	2.276	3.410	6.814
8750	12000	300000	8590.91	11662.85	299530.51	2.244	4.797	6.680
9000	14000	350000	8839.59	13660.38	349529.90	2.281	4.842	6.697
12000	16000	370000	11842.11	15654.36	369531.16	2.228	4.920	6.679
14000	18000	400000	13843.41	17665.89	399538.84	2.222	4.754	6.577
16000	20000	450000	15843.14	19673.81	449549.19	2.215	4.645	6.414
	30000			29693.36			4.372	

Table C12 Adsorption isotherm of anionic surfactant solutions on PVC

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PVC)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	75.87	186.75	3979.99	0.528	0.238	0.374
175	400	6000	140.11	379.01	5970.14	0.632	0.378	0.559
350	600	8000	290.37	571.29	7963.30	1.150	0.529	0.687
525	800	10000	463.46	766.99	9957.61	1.131	0.640	0.794
700	1000	20000	639.95	963.67	19927.79	1.141	0.660	1.352
875	1400	40000	794.99	1344.22	39876.32	1.461	1.005	2.313
1750	1800	60000	1654.58	1743.56	59800.27	1.756	1.043	3.741
3500	2000	80000	3397.78	1941.89	79758.43	1.975	1.059	4.517
5000	4000	100000	4895.15	3896.58	99672.29	2.011	1.892	6.128
6000	6000	150000	5885.97	5830.84	149513.32	2.065	3.117	9.112
7000	8000	200000	6876.37	7716.70	199448.11	2.225	5.315	10.325
8000	10000	250000	7880.56	9614.15	249440.66	2.291	7.063	10.460
8750	12000	300000	8627.67	11576.74	299439.14	2.346	7.676	10.493
9000	14000	350000	8869.27	13594.71	349437.63	2.387	7.603	10.534
12000	16000	370000	11876.28	15610.08	369417.17	2.389	7.431	10.917
14000	18000	400000	13875.33	17582.77	399449.78	2.446	7.555	10.302
16000	20000	450000	15870.43	19607.62	449438.11	2.401	7.475	10.524
	30000			29581.68			7.590	

Table C13 Adsorption isotherm of anionic surfactant solutions on ABS

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ ABS)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	59.67	183.60	3978.81	0.372	0.135	0.175
175	400	6000	120.15	377.15	5968.21	0.453	0.189	0.262
350	600	8000	281.14	541.32	7966.55	0.565	0.484	0.276
525	800	10000	456.33	731.58	9959.52	0.564	0.566	0.334
700	1000	20000	623.50	923.97	19938.57	0.625	0.628	0.507
875	1400	40000	795.74	1301.84	39908.53	0.650	0.812	0.754
1750	1800	60000	1667.64	1665.54	59832.43	0.676	1.110	1.385
3500	2000	80000	3392.01	1871.12	79798.21	0.889	1.064	1.667
5000	4000	100000	4861.06	3799.01	99747.83	1.143	1.661	2.084
6000	6000	150000	5857.96	5655.77	149680.84	1.169	2.835	2.633
7000	8000	200000	6855.59	7605.68	199551.15	1.193	3.250	3.704
8000	10000	250000	7856.26	9591.69	249501.68	1.176	3.364	4.116
8750	12000	300000	8607.75	11540.31	299520.15	1.172	3.794	3.960
9000	14000	350000	8856.28	13548.67	349502.55	1.183	3.723	4.107
12000	16000	370000	11856.43	15529.94	369524.72	1.183	3.876	3.922
14000	18000	400000	13860.77	17523.94	399527.78	1.151	3.932	3.897
16000	20000	450000	15854.85	19553.87	449541.72	1.193	3.685	3.779
	30000			29541.16			3.782	

Table C14 Adsorption isotherm of anionic surfactant solutions on PMMA

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PMMA)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	66.56	176.00	3962.97	0.412	0.257	0.398
175	400	6000	129.75	356.22	5955.27	0.485	0.471	0.480
350	600	8000	281.86	538.02	7940.64	0.731	0.667	0.638
525	800	10000	458.44	718.78	9920.61	0.714	0.874	0.853
700	1000	20000	614.64	881.64	19857.10	0.917	1.272	1.536
875	1400	40000	763.01	1264.29	39782.60	1.204	1.456	2.332
1750	1800	60000	1593.32	1643.61	59614.84	1.684	1.676	4.140
3500	2000	80000	3327.33	1816.83	79464.54	1.850	1.969	5.754
5000	4000	100000	4820.97	3655.70	99367.01	1.924	3.701	6.788
6000	6000	150000	5815.25	5529.45	149034.05	1.981	5.050	10.380
7000	8000	200000	6812.85	7340.02	198937.38	2.005	7.092	11.405
8000	10000	250000	7809.64	9254.68	248907.12	2.046	8.002	11.744
8750	12000	300000	8561.68	11062.66	298851.67	2.022	10.052	12.325
9000	14000	350000	8808.82	13044.86	348734.89	2.050	10.259	13.567
12000	16000	370000	11809.22	15052.38	368703.90	2.050	10.183	13.922
14000	18000	400000	13813.33	17052.29	398725.73	2.004	10.184	13.666
16000	20000	450000	15810.93	19044.97	448748.77	2.032	10.262	13.440
	30000			29047.65			10.246	

Table C15 Adsorption isotherm of anionic surfactant solutions on PA66

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole/m}^2$ PA66)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
105	200	4000	44.94	166.51	3921.24	0.717	0.401	0.943
175	400	6000	62.91	345.87	5898.72	1.340	0.646	1.213
350	600	8000	93.02	522.97	7898.58	3.060	0.920	1.213
525	800	10000	218.16	705.18	9858.71	3.649	1.136	1.687
700	1000	20000	342.43	890.06	19791.40	4.264	1.315	2.494
875	1400	40000	442.59	1246.31	39632.42	5.138	1.839	4.396
1750	1800	60000	932.87	1595.78	59482.36	9.748	2.438	6.195
3500	2000	80000	2631.90	1782.52	79348.19	10.390	2.601	7.807
5000	4000	100000	4093.07	3613.42	99236.72	10.815	4.619	9.132
6000	6000	150000	5091.18	5375.43	149101.04	10.855	7.472	10.755
7000	8000	200000	6076.56	7176.70	198939.25	11.034	9.853	12.685
8000	10000	250000	7020.81	9055.19	248781.28	11.682	11.308	14.586
8750	12000	300000	7737.93	10798.38	298681.88	12.069	14.399	15.744
9000	14000	350000	7996.12	12743.87	348686.05	11.986	15.010	15.719
12000	16000	370000	10991.19	14782.66	368688.63	12.054	14.523	15.689
14000	18000	400000	12986.44	16629.37	398720.17	12.092	16.411	15.324
16000	20000	450000	15001.74	18811.43	448685.54	11.928	14.208	15.707
	30000			28768.72			14.701	

Table C16 Adsorption isotherm of anionic surfactant solutions on PCL

Initial surfactant concentration (μM)			Equilibrium surfactant concentration (μM)			Amount of adsorbed surfactant ($\mu\text{mole}/\text{m}^2$ PCL)		
SDS	SOBS	C8	SDS	SOBS	C8	SDS	SOBS	C8
200	200	2500	95.43	175.77	2468.76	1.683	0.391	0.502
400	400	5000	285.29	362.64	4941.21	1.842	0.602	0.941
600	600	10000	444.66	528.90	9891.30	2.496	1.139	1.747
800	800	20000	589.21	687.05	19837.81	3.376	1.813	2.598
1000	1000	40000	782.63	836.72	39786.25	3.487	2.614	3.430
2000	1200	60000	1730.24	1022.33	59699.98	4.331	2.854	4.811
4000	1600	80000	3599.38	1411.23	79577.11	6.422	3.040	6.770
5000	2000	100000	4581.31	1747.60	99458.33	6.706	4.046	8.669
6000	4000	150000	5560.49	3734.30	149333.71	7.039	4.269	10.727
7000	6000	200000	6576.49	5634.70	199267.92	6.788	5.855	11.734
8000	8000	250000	7550.58	7442.62	249246.48	7.198	8.923	12.069
9000	10000	300000	8557.08	9373.96	299134.31	7.105	10.035	13.915
10000	12000	350000	9539.15	11264.84	349116.78	7.390	11.779	14.180
12000	14000	370000	11538.28	13266.36	369120.55	7.419	11.755	14.102
14000	16000	400000	13550.84	15222.88	399105.68	7.200	12.432	14.404
16000	18000	450000	15557.59	17224.79	449122.22	7.083	12.496	14.064
18000	20000	500000	17550.16	19246.14	499124.70	7.210	12.084	14.053
25000	30000		24532.12	29230.89		7.506	12.343	

Table C17 Adsorption isotherm of surfactant solutions on PTFE at pH 3 and 9

Initial CTAB concentration (μM)	Equilibrium CTAB concentration (μM)		Amount of adsorbed CTAB ($\mu\text{mole}/\text{m}^2$ PTFE)	
	pH 3	pH 9	pH 3	pH 9
80	58.05	50.81	0.144	0.195
100	79.40	64.78	0.138	0.236
200	159.51	160.19	0.265	0.252
300	244.63	253.53	0.357	0.297
400	307.93	317.40	0.599	0.525
500	375.96	382.70	0.800	0.786
600	428.98	414.95	1.136	1.171
700	498.22	498.85	1.280	1.363
800	589.58	573.68	1.405	1.517
900	681.54	632.43	1.442	1.811
1000	759.00	695.60	1.566	1.922
2000	1745.70	1711.18	1.567	1.876
3000	2748.66	2717.03	1.652	1.812
4000	3736.39	3711.95	1.713	1.823
5000	4741.10	4739.33	1.638	1.728
6000	5759.31	5713.36	1.595	1.901
7000	6734.68	6734.62	1.735	1.677

Initial SDS concentration (μM)	Equilibrium SDS concentration (μM)		Amount of adsorbed SDS ($\mu\text{mole}/\text{m}^2$ PTFE)	
	pH 3	pH 9	pH 3	pH 9
200	146.95	185.68	0.349	0.095
400	305.19	375.64	0.632	0.158
600	479.46	553.60	0.796	0.303
800	657.60	745.10	0.921	0.360
1000	846.47	937.79	1.003	0.407
2000	1764.53	1878.43	1.551	0.794
4000	3731.41	3837.05	1.739	1.064
5000	4732.10	4792.27	1.747	1.355
6000	5716.92	5779.18	1.864	1.436
7000	6694.60	6763.59	1.981	1.544
8000	7648.25	7746.05	2.295	1.653
9000	8633.62	8753.89	2.381	1.603
10000	9612.67	9742.73	2.520	1.680
12000	11608.94	11752.06	2.566	1.619
14000	13617.79	13742.38	2.470	1.681
16000	15614.04	15745.38	2.506	1.663
18000	17597.53	17742.03	2.605	1.682
25000	24616.13	24752.52	2.498	1.613

Table C18 Adsorption isotherm of surfactant solutions on PVC at pH 3 and 9

Initial CTAB concentration (μM)	Equilibrium CTAB concentration (μM)		Amount of adsorbed CTAB ($\mu\text{mole}/\text{m}^2$ PVC)	
	pH 3	pH 9	pH 3	pH 9
80	36.61	48.02	0.785	0.612
100	53.22	62.20	0.892	0.686
200	117.10	125.94	1.615	1.389
300	228.12	235.78	1.392	1.191
400	303.56	300.30	1.839	1.863
500	371.44	379.43	2.898	2.305
600	447.20	454.25	2.837	2.756
700	521.96	545.38	3.272	2.854
800	600.96	637.74	3.790	2.929
900	692.53	735.33	3.888	3.202
1000	765.42	797.88	4.271	3.645
2000	1745.50	1798.63	4.939	3.864
3000	2746.84	2810.41	4.688	3.476
4000	3735.36	3803.21	5.121	3.536
5000	4763.65	4828.32	4.456	3.261
6000	5753.27	5806.88	4.687	3.597
7000	6747.92	6812.45	4.727	3.593

Initial SDS concentration (μM)	Equilibrium SDS concentration (μM)		Amount of adsorbed SDS ($\mu\text{mole}/\text{m}^2$ PVC)	
	pH 3	pH 9	pH 3	pH 9
200	100.76	183.25	1.841	0.314
400	286.02	372.65	2.122	0.512
600	466.70	540.24	2.488	1.116
800	655.45	719.43	2.666	1.504
1000	842.36	904.52	2.955	1.794
2000	1785.79	1897.78	3.976	1.918
4000	3754.04	3890.00	4.616	2.055
5000	4753.43	4883.89	4.548	2.174
6000	5749.63	5877.78	4.671	2.286
7000	6726.13	6877.38	5.122	2.301
8000	7686.10	7853.53	5.884	2.741
9000	8696.92	8848.69	5.656	2.836
10000	9695.04	9856.52	5.647	2.684
12000	11703.97	11853.18	5.549	2.752
14000	13712.91	13849.84	5.343	2.820
16000	15702.78	15859.18	5.574	2.643
18000	17699.00	17849.50	5.618	2.810
25000	24692.14	24866.33	5.607	2.502

Table C19 Adsorption isotherm of SDS solutions on paper fiber and carbon black at pH 7 and 9

Equilibrium SDS concentration (μM)				Amount of adsorbed SDS ($\mu\text{mole}/\text{m}^2$)			
Paper fiber		Carbon black		Paper fiber		Carbon black	
pH 7	pH 9	pH 7	pH 9	pH 7	pH 9	pH 7	pH 9
330.6	462.89	51.34	56.03	0.042	0.009	0.162	0.204
516.65	515.37	55.89	60.58	0.071	0.021	0.204	0.224
962.78	677.99	66.83	63.62	0.134	0.031	0.244	0.245
1209.67	870.41	69.86	67.89	0.198	0.032	0.286	0.286
1418.29	1069.32	89.30	96.02	0.395	0.045	0.326	0.325
1719.54	1267.14	102.27	102.03	0.445	0.058	0.366	0.366
1696.36	1521.36	125.40	140.83	0.576	0.057	0.406	0.405
2067.34	1657.74	149.49	202.58	0.608	0.086	0.438	0.441
2294.01	1913.16	160.60	259.93	0.677	0.084	0.445	0.478
3213.8	2119.68	202.01	328.68	0.572	0.095	0.483	0.514
3794.61	2195.78	244.06	411.02	0.551	0.139	0.521	0.549
4806.48	2305.27	458.48	483.90	0.548	0.174	0.587	0.585
5634.97	2708.82	481.25	622.90	0.591	0.198	0.627	0.615
7621.98	3024.22	625.38	688.11	0.595	0.244	0.656	0.651
13247.55	3438.23	672.02	842.08	0.438	0.265	0.694	0.680
18323.36	3740.88	711.14	967.92	0.419	0.315	0.732	0.711
	4253.22	876.17	1095.57		0.312	0.760	0.742
	4643.20	1229.71	1392.43		0.339	0.814	0.801
	4941.81	1641.82	1806.43		0.390	0.863	0.849
	5475.57	1909.34	2116.57		0.381	0.924	0.907
	5857.03	2288.79	2536.16		0.411	0.976	0.955
	6371.83	2550.13	2904.52		0.407	1.037	1.008
	6883.91	2905.69	3204.20		0.404	1.091	1.066
	7320.10	3370.43	3558.84		0.420	1.136	1.120
	8164.92	3670.11	3906.08		0.459	1.194	1.174
	13098.98	4070.98	4422.30		0.475	1.244	1.215
	18159.40	4344.23	4785.90		0.460	1.305	1.268
		4723.78	5199.40			1.356	1.317
		5090.23	5677.58			1.409	1.360
		5307.71	5822.40			1.474	1.431
		5917.11	5931.72			1.590	1.506
		6497.61	6142.11			1.625	1.571
		8127.95	6759.44			1.823	1.603
		10095.31	7486.08			2.075	1.709
		15080.09	8409.08			2.077	1.799
		25063.50	11288.88			2.078	1.976
		34921.27	15582.18			2.090	2.035
			25299.31				2.058
			35248.28				2.063

Table C20 Adsorption isotherm of SDS solutions on paper fiber and carbon black with calcium ions at pH 9

Equilibrium SDS concentration (μM)					Amount of adsorbed SDS ($\mu\text{mole/m}^2$)				
Paper fiber		Carbon black			Paper fiber		Carbon black		
*[Ca ²⁺] (μM)		[Ca ²⁺] (μM)			[Ca ²⁺] (μM)		[Ca ²⁺] (μM)		
100	1000	100	700	1000	100	1000	100	700	1000
148.96	170.78	19.01	1745.82	1155.02	0.042	0.007	0.665	1.018	1.070
423.40	337.47	104.37	2401.06	1827.20	0.071	0.016	0.700	1.133	1.181
694.33	474.30	291.43	3051.57	2515.65	0.134	0.031	0.726	1.246	1.290
875.16	663.67	354.37	3754.46	3124.18	0.198	0.034	0.762	1.354	1.406
1353.93	833.99	467.12	4363.54	3727.56	0.395	0.042	0.794	1.470	1.523
1581.41		845.88	5019.89	4373.77	0.445		0.846	1.582	1.636
1682.89		1222.08	5749.11	5009.29	0.576		0.898	1.688	1.749
1985.40		1530.55	6225.43	5648.71	0.608		0.956	1.815	1.863
2290.70		1878.80	7095.35	6251.31	0.677		1.010	1.909	1.979
2571.03		2257.80	7822.16	6971.23	0.572		1.062	2.015	2.086
5976.17		2585.16	9151.18	10572.4	0.551		1.118	2.071	2.119
6583.81		2955.97	11049.6	12542.1	0.548		1.170	2.079	2.121
7719.22		3317.98	12910.5	14471.6	0.591		1.224	2.091	2.127
10638.0		3634.69	14691.7	19466.4	0.595		1.280	2.109	2.128
12890.5		4007.07			0.438		1.333		
15791.7		4370.66			0.419		1.386		
17668.4		4635.22					1.447		
		5425.19					1.548		
		5645.77					1.613		
		5883.28					1.676		
		6356.07					1.804		
		6766.03					1.853		
		7243.81					1.896		
		10634.4					2.030		
		14970.9					2.086		
		19983.9					2.085		
		25066.4					2.078		
		30025.6					2.081		
		34848.3					2.096		

*Note [Ca²⁺] stands for initial calcium ion concentration

Table C21 Adsorption isotherm of C8 solutions on paper fiber with calcium ions at pH 9

Equilibrium C8 concentration (μM)			Amount of adsorbed C8 ($\mu\text{mole}/\text{m}^2$)		
* $[\text{Ca}^{2+}]$ (μM)			$[\text{Ca}^{2+}]$ (μM)		
0	100	1000	0	100	1000
128.13	257.29	419.79	0.111	0.201	0.165
1462.50	1192.71	1358.33	0.145	0.213	0.174
2470.83	2884.38	2370.83	0.153	0.285	0.176
3603.13	5061.46	3257.29	0.115	0.242	0.207
4366.67	6827.08	4872.92	0.190	0.268	0.284
5755.21	8807.29	7035.42	0.232	0.267	0.211
7668.75	13817.7	8723.96	0.273	0.405	0.298
9242.71	18130.2		0.244	0.538	
16008.3	21755.2		0.484	0.689	
19274.0	26796.9		0.524	0.952	
29081.3	30630.2		0.633	0.876	
39055.2			0.822		
54263.5			1.714		
72362.5			2.183		
90826.0			1.747		
107753			2.684		
144368			2.899		
183014			3.023		
279576			3.882		
364420			6.043		
443326			8.192		
536243			8.127		
653639			7.814		
744472			7.866		

*Note $[\text{Ca}^{2+}]$ stands for initial calcium ion concentration

Table C22 Adsorption isotherm of C8 solutions on carbon black with calcium ions at pH 9

Equilibrium C8 concentration (μM)				Amount of adsorbed C8 ($\mu\text{mole/m}^2$)			
* $[\text{Ca}^{2+}]$ (μM)				$[\text{Ca}^{2+}]$ (μM)			
0	100	700	1000	0	100	700	1000
1689.20	746.02	300.54	676.02	0.025	0.022	0.067	0.134
2353.95	1419.32	711.54	1946.71	0.056	0.051	0.117	0.223
2905.25	1971.09	1365.34	2458.14	0.100	0.092	0.153	0.261
5653.09	2975.23	3630.53	2875.98	0.216	0.098	0.197	0.304
5923.05	3211.66	5203.17	6685.84	0.287	0.168	0.244	0.613
7337.93	3849.47	6313.01	9825.31	0.303	0.184	0.320	0.732
14979.5	5023.20	7472.92	11959.9	0.517	0.173	0.501	0.833
28366.4	5723.08	10483.1	20889.7	0.964	0.201	0.588	0.938
37626.5	6103.03	14774.4		1.249	0.255	0.601	
50286.0	6687.97	22459.7		1.185	0.298	0.761	
55400.9	16410.2	30309.1		1.429	0.392	0.890	
62775.3	22414.7			1.610	0.755		
72211.7	31270.6			1.603	0.849		
80397.8	37145.6			1.771	1.140		
99700.2	47243.0			1.805	1.177		
112481	54197.2			2.525	1.413		
151189	61621.3			2.497	1.632		
168660	68797.9			3.075	1.943		
219971	77132.9			2.941	2.127		
254678	91654.6			4.694	2.285		
355063	106995			3.216	2.906		
524895	129051			7.118	3.034		
621255	147077			6.412	3.142		
	166159				3.417		

*Note $[\text{Ca}^{2+}]$ stands for initial calcium ion concentration

Table C23 Adsorption isotherm of calcium ions on paper fiber and carbon black at pH 9

Equilibrium Ca ²⁺ concentration (μM)		Amount of adsorbed Ca ²⁺ (μmole/m ²)	
Paper fiber	Carbon black	Paper fiber	Carbon black
224.38	53.13	0.085	0.101
590.00	76.88	0.122	0.124
1446.88	46.88	0.337	0.154
3889.38	468.75	0.870	0.190
6551.88	1175.00	0.617	0.305
9595.63	1737.50	0.865	0.423
12339.38	2850.00	1.396	0.462
15576.88	4175.00	1.693	0.538
19564.38	5093.75	1.856	0.646
24889.38	6593.75	2.262	0.660
35514.38	7800.00	1.987	0.792
	9262.50		0.748
	11812.5		0.784
	13912.5		0.805
	15768.7		0.809
	18550.0		0.845
	20237.5		0.879
	22360.0		0.867
	24062.5		0.901
	26262.5		0.878

Table C24 Adsorption isotherm of calcium ions on paper fiber and carbon black with various SDS concentration at pH 9

Equilibrium Ca ²⁺ concentration (μM)				Amount of adsorbed Ca ²⁺ (μmole/m ²)			
Paper fiber		Carbon black		Paper fiber		Carbon black	
*[SDS] (μM)		[SDS] (μM)		[SDS] (μM)		[SDS] (μM)	
500	1000	100	200	500	1000	100	200
43.14	52.37	427.37	202.62	0.018	0.020	0.251	0.1934
101.25	88.22	990.96	390.90	0.039	0.034	0.303	0.2052
163.59	181.80	2607.12	820.45	0.058	0.069	0.370	0.2431
309.73	332.61	3983.84	1211.72	0.096	0.112	0.423	0.2575
481.80	508.11	5885.41	1988.20	0.127	0.119	0.442	0.2849
611.47	636.66	7855.61	2618.45	0.123	0.143	0.472	0.2986
776.81	902.74	9640.77	3327.93	0.140	0.199	0.485	0.3226
1509.98		15739.2	3789.95	0.158		0.500	0.3277
2981.30		18513.7	4748.13	0.208		0.513	0.3331
		20456.4	6188.13			0.502	0.3558
		22917.7	8824.93			0.506	0.3639
		25405.2	9763.09			0.504	0.3723
		26752.4				0.496	
		30058.4				0.528	
		32113.5				0.506	

*Note [SDS] stands for initial SDS concentration

Table C25 Adsorption isotherm of calcium ions on paper fiber and carbon black with various C8 concentration at pH 9

Equilibrium Ca ²⁺ concentration (μM)					Amount of adsorbed Ca ²⁺ (μmole/m ²)				
Paper fiber		Carbon black			Paper fiber		Carbon black		
*[C8] (μM)		[C8] (μM)			[C8] (μM)		[C8] (μM)		
500	1000	100	500	1000	500	1000	100	500	1000
430.00	468.13	81.25	105.00	93.75	0.138	0.167	0.058	0.049	0.046
1192.50	1071.88	51.88	93.75	88.13	0.403	0.334	0.119	0.097	0.099
2797.50	2269.38	506.25	150.00	175.00	0.430	0.458	0.227	0.200	0.197
6053.75	6056.88	687.50	1143.75	618.75	0.648	0.551	0.413	0.350	0.374
9728.75	10281.9	2475.00	1337.50	1362.50	0.651	0.623	0.416	0.489	0.481
14066.2	12738.1	2962.50	2381.25	1712.50	0.918	0.786	0.579	0.632	0.645
16141.2	16600.6	4900.00	3468.75	3012.50	1.237	0.956	0.568	0.709	0.734
24741.2	37238.1	8206.25	6987.50	5675.00	1.349	0.844	0.693	0.850	0.918
34478.8		12300.0	9500.00	8937.50	1.549		0.736	0.945	0.997
		15575.0	12812.5	12162.5			0.832	1.008	1.043
		19325.0	16887.5	16237.5			0.865	0.999	1.065
		22837.5	20712.5	19687.5			0.922	1.040	1.082
		26937.5	24700.0	24600.0			0.901	1.000	1.063

*Note [C8] stands for initial C8 concentration

Appendix D Example of Calculation for Surfactant Adsorption Isotherms

Adsorption for solution of CTAB on PVC

$$\text{Surfactant}_{ads} = \frac{[\text{Surfactant}]_I - [\text{Surfactant}]_E \times V_{sol}}{1,000 \times W_{plastic} \times a_s}$$

where

Surfactant_{ads} = Surfactant adsorption, ($\mu\text{mole}/\text{m}^2$)

$[\text{Surfactant}]_I$ = Initial surfactant solution concentration, (μM)

$[\text{Surfactant}]_E$ = Equilibrium surfactant solution concentration, (μM)

V_{sol} = Volume of solution, (mL)

$W_{plastic}$ = Weight of plastic sample, (g)

a_s = Specific surface area of plastic sample, (m^2/g)

At $[\text{Surfactant}]_I = 10,000 \mu\text{M}$.

The equilibrium surfactant solution concentration is converted from

TOC (total organic carbon analyzer) in ppm $\rightarrow \mu\text{M}$.

The calibration equation for CTAB solution from TOC,

$$Y = 4.5008X,$$

where

$Y = [\text{Surfactant}]_E, (\mu\text{M})$

$X = \text{TOC value} = 2173.0875 \text{ ppm}$.

Substituting into calibration equation,

$$X = 4.5008 \times 2173.0875 = 9780.63 \mu\text{M}.$$

Thus, surfactant adsorption for CTAB solution on PVC at 10,000 μM of initial surfactant solution concentration is

$$\text{Surfactant}_{ads} = \frac{(10,000 - 9780.63) \times 20}{1,000 \times 0.2511 \times 4.266} = 4.096 \mu\text{mole}/\text{m}^2\text{PVC}$$

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