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APPENDIX A

Experimental Data

Table A1 The results of steady-state experiment

Conditions: [CPC] in feed = 0.225 mM; Foam height = 30 cm; Air flow rate = 60 L/min; Number of trays = 5 and Feed flow rate = 50 ml/min

Time (hr)	Concentration (μM)					
	Effluent	Tray 1	Tray 2	Tray 3	Tray 4	Tray 5
1	30.24	36.67	37.86	49.76	72.62	119.52
2	26.43	29.52	35.24	46.67	72.86	116.67
3	27.62	30.24	37.14	48.57	72.38	118.10
4	26.67	29.29	33.33	50.24	76.90	121.43
5	26.19	30.48	36.67	53.10	81.43	130.24
6	26.23	31.27	35.75	54.44	82.38	130.28
7	25.24	28.81	38.10	50.95	84.05	132.86

Table A2 The results of Operational zone of the five-stage foam fractionation column

Conditions: Total concentration = 0.225 mM; Foam height = 30 cm; Number of tray = 5

Air Flow Rate	Maximum Feed Flow Rate (mL/min)					Minimum Feed Flow Rate (mL/min)				
(L/min)	CPC	3:1	1:1	1:3	$OPEO_{10}$	CPC	3:1	1:1	1:3	$OPEO_{10}$
40	160	165	165	170	170	40	40	40	40	40
60	160	160	165	165	170	25	25	25	25	25
80	145	145	150	150	150	25	25	25	25	25
100	130	130	130	130	130	25	25	25	25	25

Table A3 Surface tension of CPC systems at different total surfactant concentration

Concentration (μM)	Surface tension (mN/m)
50	67.6100
60	66.6100
80	62.3800
100	61.0133
200	58.4433
225	57.9067
300	52.9733
500	49.4933
700	46.0000
1000	43.0767
2000	42.6000
3000	42.3233
4000	42.7500

Table A4 Surface tension of $OPEO_{10}$ systems at different total surfactant concentration

Concentration (μM)	Surface tension (mN/m)
50	44.5720
60	42.9700
70	42.0160
80	40.4240
100	39.1000
200	32.8500
225	32.2000
250	32.0500
300	31.1200
500	30.9600
750	31.0520
1000	31.0180
2000	31.9800
3000	31.0200
4000	31.0560

Table A5 Surface tension of mixed surfactant systems at molar ratio of CPC to $OPEO_{10}$ = 1:3 at different total surfactant concentration

Concentration (uM)	Surface tension (mN/m)
50	49.0533
100	41.4733
150	38.4133
200	35.8433
225	35.2600
300	34.5500
400	34.3667
500	34.5033
600	34.4700
700	34.4300
800	34.4700
900	34.4200
1000	34.4502
2000	34.3510
3000	34.0321
4000	33.9800

Table A6 Surface tension of mixed surfactant systems at molar ratio of CPC to $OPEO_{10}$ = 1:1 at different total surfactant concentration

Concentration (uM)	Surface tension (mN/m)
50	52.7133
100	46.4800
200	40.4600
225	38.7000
300	36.9733
400	36.5633
500	36.6767
550	36.6000
600	36.7833
650	36.9167
700	36.8433
750	36.8700
800	36.6767
850	36.8833
900	36.7000
1000	36.7523
2000	36.5840
3000	36.8120
4000	36.6880

Table A7 Surface tension of mixed surfactant systems at molar ratio of CPC to $OPEO_{10}$ = 3:1 at different total surfactant concentration

Concentration (uM)	Surface tension (mN/m)
50	59.6167
100	51.3067
200	44.4467
225	43.6600
300	40.6700
400	38.0300
500	38.1767
550	37.8900
600	38.2267
650	38.3167
700	38.4433
750	38.5633
800	38.5000
850	38.4433
900	38.5233
1000	38.4200
2000	38.5240
3000	38.3350
4000	38.2200

Table A8 Experimental data of foam stability

Surfactant Systems	Foam Stability (min)
pure CPC	6.46
CPC:$OPEO_{10}$ = 3:1	12.29
CPC:$OPEO_{10}$ = 1:1	9.25
CPC:$OPEO_{10}$ = 1:3	7.01
pure $OPEO_{10}$	5.51

Table A9 Experimental data of foam ability

Surfactant Systems	Foam ability
pure CPC	2.09
CPC:$OPEO_{10}$ = 3:1	2.85
CPC:$OPEO_{10}$ = 1:1	3.02
CPC:$OPEO_{10}$ = 1:3	3.56
pure $OPEO_{10}$	3.81

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