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APPENDIX

Appendix A : Details of Equipment

TABLE A-1
The Information of Equipment

Equipment	Manufacture	Model
Centrifugal Pump	Marathon Electric	XQN56C34F5534A 1/2 -3/8 hp Serial No. GG 14328
Feed Flow Meter	Gilmont Instrument. Inc.	Tube size 240 Float type : glass
Nozzle Spray	Pennyful (Thailand) CO..Ltd.	Nozzle size ¼ inch. 50 ° , PVDF Model E-83251-10

Appendix B : Technical data of nonionic surfactants (Handbook of Industrial Surfactant).

Technical Data for CO-610

Igepal CO-610 [Rhone-Poulenc Surf] Nonoxynol-8 (7-8 EO); CAS 9016-45-9; nonionic; low foaming detergent, wetting agent, emulsifier, lubricant; for metal working; biodeg; FDA compliance; pale yel. Liq., aromatic odor, sol. in naphtha, xylene, butyl Cellusolve, perchloroethylene, ethanol, water, sp.gr. 1.05; visc. 230-290 cps; HLB 12.2; cloud pt. 72-82 F (1%) flash pt. > 200 F (PMCC); pour pt. 37 ± 2 F; surf. Tens. 30 dynes/cm (0.01 %); 100 %act.

Technical Data for CO-630

Igepal CO-630 [Rhone-Poulenc Surf] Nonoxynol-9 ; CAS 9016-45-9; nonionic; detergent, wetting agent and rewetting agent, corrosion inhibitor, penetrant, emulsifier, dispersant for textile, paper, leather, household/industrial cleaners, agric., paints, metal processing, emulsion cleaning ; biodeg; FDA, EPA compliance; almost colorless liq., aromatic odor, sol. in naphtha, xylene, butyl Cellusolve, perchloroethylene, ethanol, water, sp.gr. 1.06; visc. 225-300 cps; HLB 13.0; cloud pt. 126-133 F (1%) flash pt. > 200 F (PMCC); pour pt. 31 ± 2 F; surf. Tens. 31 dynes/cm (0.01 %); toxicology: severe eye irritant; LD50(oral, rat) 3 g/kg; 100 %act.

Technical Data for CO-660

Igepal CO-660 [Rhone-Poulenc Surf] Nonoxynol-10, CAS 9016-45-9; nonionic; detergent, wetting agent and rewetting agent, corrosion inhibitor, penetrant, emulsifier for textile, paper, leather, household/industrial cleaners, agric., paints, metal processing, emulsion cleaning ; biodeg; FDA, EPA compliance; pale yel. liq., aromatic odor, sol. in naphtha, xylene, butyl Cellusolve, perchloroethylene, ethanol. water, sp.gr. 1.06; visc. 225-275 cps; HLB 13.2 ; cloud pt. 140-149 F (1%); flash pt. > 200 F (PMCC) ; pour pt. 46±2 F; surf. Tens. 31 dynes/cm (0.01 %); 100 %act.

Appendix C : Ross-Miles Test Data

Table C-1 Foam height of NP(EO)₈ at each concentration

Temp (°C)	Foam height of NP(EO) ₈					
	0.01 vol%		0.1 vol%		1.0 vol%	
	0 min	5 min	0 min	5 min	0 min	5 min
10	4.05	3.90	8.50	7.60	10.25	9.35
20	3.40	3.05	10.00	7.70	10.00	8.85
30	3.50	2.90	5.40	3.40	7.50	3.50
40	3.55	2.40	4.10	3.20	5.60	3.05
50	3.15	1.25	4.60	1.70	4.85	1.35
60	3.50	0.95	9.20	0.90	6.60	2.20
70	3.60	0.75	10.50	0.70	7.525	1.00

Table C-2 Foam height of NP(EO)₉ at each concentration

Temp (°C)	Foam height of NP(EO) ₉					
	0.01 vol%		0.1 vol%		1.0 vol%	
	0 min	5 min	0 min	5 min	0 min	5 min
10	4.475	4.25	12.00	11.45	18.60	17.90
20	5.00	4.35	12.90	12.15	19.30	18.65
30	5.80	4.725	13.10	11.525	21.10	19.00
40	5.475	3.525	12.725	7.125	18.50	1.35
50	5.05	3.05	13.50	5.15	19.80	1.25
60	4.15	1.55	11.40	1.35	15.50	1.10
70	3.00	0.20	7.15	0.70	4.40	0.70

Table C-3 Foam height of NP(EO)₁₀ at each concentration

Temp (°C)	Foam height of NP(EO) ₁₀					
	0.01 vol%		0.1 vol%		1.0 vol%	
	0 min	5 min	0 min	5 min	0 min	5 min
10	5.50	4.80	13.10	11.10	19.85	17.40
20	5.55	5.00	13.80	11.375	20.50	18.40
30	6.60	5.55	14.25	12.80	21.60	18.75
40	6.00	4.30	15.30	10.80	21.05	15.10
50	5.90	1.70	15.35	5.45	21.85	10.90
60	5.95	1.45	14.30	2.05	19.925	2.25
70	4.80	0.90	12.25	0.80	20.60	0.85
80	4.10	0.55	7.00	0.40	5.85	0.65

Table C-4 Stability Index of NP(EO)₈ at each concentration

Temp (°C)	Stability index of NP(EO) ₈ at each concentration (vol%)		
	0.01	0.10	1
10	0.96	0.89	0.91
20	0.90	0.77	0.89
30	0.83	0.63	0.47
40	0.68	0.78	0.54
50	0.40	0.37	0.28
60	0.27	0.10	0.33
70	0.21	0.07	0.13

Table C-5 Stability Index of NP(EO)₉ at each concentration

Temp (°C)	Stability index of NP(EO) ₉ at each concentration (vol%)		
	0.01	0.10	1
10	0.95	0.95	0.96
20	0.87	0.94	0.97
30	0.81	0.88	0.90
40	0.64	0.56	0.07
50	0.60	0.38	0.06
60	0.37	0.12	0.07
70	0.07	0.10	0.16

Table C-6 Stability Index of NP(EO)₁₀ at each concentration

Temp (°C)	Stability index of NP(EO) ₁₀ at each concentration (vol%)		
	0.01	0.10	1
10	0.87	0.85	0.88
20	0.90	0.82	0.90
30	0.84	0.90	0.87
40	0.72	0.71	0.72
50	0.29	0.36	0.50
60	0.24	0.14	0.11
70	0.19	0.07	0.04
80	0.13	0.06	0.11

Appendix D : Spray Test Data

Table D-1 Foam height of 0.01 vol% NP(EO)₉ at each temperature

Temp = 30°C : Original foam height = 10.2 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.8	21.2	24.4	25.7	25.8	25.7
13.5	21.5	24.6	25.7	25.8	25.7
15.8	22	24.8	25.7	25.8	25.6
16.2	22.4	25	25.8	25.8	25.6
17.1	22.7	25.1	25.8	25.8	25.6
17.9	23.1	25.2	25.8	25.8	25.6
18.7	23.5	25.3	25.8	25.8	25.6
19.4	23.7	25.4	25.8	25.8	25.6
20	24	25.5	25.8	25.8	25.5
20.6	24.2	25.6	25.8	25.7	25.5

Temp = 40°C : Original foam height = 10.4 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.6	21.4	25.4	26.9	27	26.7
13.2	21.9	25.6	26.9	27	26.7
14.6	22.5	25.8	27	27	26.6
15.9	22.9	26	27	26.9	26.6
17	23.4	26.2	27	26.9	26.6
17.9	23.8	26.4	27.1	26.9	26.5
18.2	24.2	26.5	27.1	26.8	26.5
19.6	24.5	26.6	27.1	26.8	26.5
20.2	24.8	26.7	27.1	26.7	26.5
20.8	25.2	26.8	27	26.7	26.4

Temp = 50°C : Original foam height = 10.7 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.5	21	25.2	26.6	26.4	25.7
13.1	21.5	25.5	26.7	26.4	25.7
14.5	22.1	25.7	26.7	26.3	25.7
15.7	22.6	25.9	26.7	26.2	25.8
16.6	23.1	26	26.7	26.1	25.8
17.5	23.5	26.2	26.7	26.1	25.8
18.4	24	26.3	26.6	26	25.8
19.2	24.3	26.4	26.6	25.9	25.8
19.8	24.6	26.5	26.6	25.8	25.8
20.4	24.9	26.6	26.5	25.7	25.8

Temp = 55°C : Original foam height = 10.3 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.8	21.4	24.7	25.7	25.7	25.5
13.4	21.9	24.9	25.7	25.7	25.5
14.9	22.3	25.1	25.7	25.7	25.5
16.2	22.8	25.2	25.7	25.7	25.5
17.4	23.2	25.3	25.8	25.7	25.5
18.1	23.5	25.4	25.8	25.7	25.5
19	23.8	25.4	25.8	25.6	25.5
19.7	24.1	25.5	25.7	25.5	25.5
20.3	24.3	25.5	25.7	25.5	25.5
20.9	24.5	25.6	25.7	25.5	25.4

Temp = 60°C : Original foam height = 10.4 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.5	20	24.1	25.6	25.7	25.4
12.8	20.6	24.4	25.6	25.7	25.3
14.1	21.1	24.6	25.7	25.7	25.3
15.1	21.6	24.8	25.7	25.7	25.3
16	22.1	24.9	25.7	25.6	25.3
16.8	22.5	25.1	25.7	25.6	25.3
17.5	22.8	25.2	25.7	25.6	25.3
18.2	23.2	25.4	25.7	25.4	25.2
18.7	23.6	25.5	25.7	25.4	25.2
19.5	23.9	25.6	25.7	25.4	25.2

Temp = 70°C : Original foam height = 10.7 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.2	21	24.3	24.9	24.7	24.2
13.6	21.5	24.4	24.9	24.6	24.2
14.9	22	24.5	24.9	24.6	24.3
16	22.4	24.6	24.8	24.4	24.4
16.9	22.7	24.7	24.8	24.3	24.4
17.7	23.1	24.8	24.7	24.2	24.3
18.5	23.4	24.8	24.7	24.2	24.3
19.1	23.7	24.8	24.7	24.2	24.3
19.8	23.9	24.8	24.7	24.2	24.3
20.3	24.1	24.9	24.7	24.2	24.3

Table D-2 Foam height of 0.1 vol% NP(EO)₉ at each temperature

Temp = 30°C : Original foam height = 11.3 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.7	23.6	28.2	30	30.5	30.4
14.4	24.1	28.5	30	30.5	30.4
16.2	24.7	28.7	30.1	30.5	30.3
17.8	25.2	29	30.2	30.5	30.3
18.5	25.7	29.2	30.3	30.5	30.2
19.6	26.2	29.4	30.3	30.5	30.2
20.6	26.7	29.5	30.4	30.5	30.1
21.5	27.1	29.7	30.4	30.5	30
22.2	27.5	29.8	30.5	30.4	29.9
22.9	27.8	29.9	30.6	30.4	29.8

Temp = 40°C : Original foam height = 10.9 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.1	22.5	27.4	29.2	29.4	28.9
13.7	23.2	27.7	29.2	29.4	28.8
15.1	23.8	28	29.3	29.3	28.7
16.5	24.4	28.2	29.4	29.3	28.5
17.6	24.9	28.4	29.4	29.3	28.5
18.7	25.4	28.6	29.4	29.2	28.5
19.6	25.9	28.8	29.4	29.2	28.5
20.4	26.4	28.9	29.4	29.1	28.5
21.1	26.8	29	29.4	29	28.4
21.8	27.1	29.1	29.4	29	28.4

Temp = 50°C : Original foam height = 10.2 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.6	21.9	26.4	28	28.1	27.8
13.1	22.5	26.7	28	28.1	27.8
14.6	23.1	26.9	28.1	28	27.8
16	23.7	27.1	28.1	28	27.8
16.9	24.1	27.3	28.1	27.9	27.8
18	24.6	27.5	28.1	27.9	27.8
18.9	25.1	27.6	28.1	27.9	27.8
19.7	25.4	27.7	28.1	27.9	27.8
20.5	25.8	27.9	28.1	27.8	27.8
21.2	26.1	28	28.1	27.8	27.8

Temp = 55°C : Original foam height = 11.4 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.5	21.3	24.8	26	26	25.6
14	21.8	25	26.1	26	25.6
15	22.2	25.2	26.1	26	25.6
16.1	22.7	25.3	26.1	25.9	25.5
17	23.1	25.5	26.1	25.8	25.5
17.9	23.6	25.5	26.1	25.8	25.5
18.7	23.9	25.6	26.1	25.8	25.5
19.4	24.2	25.8	26.1	25.7	25.5
20.1	24.4	25.9	26.1	25.7	25.5
20.7	24.6	26	26	25.6	25.5

Temp = 60°C : Original foam height = 10.5 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.5	21.1	24	25.5	25.7	23.6
13.8	21.6	24.2	25.5	25.5	23.6
15.1	21.9	24.4	25.6	25.3	23.5
16.3	22.2	24.5	25.7	25.1	23.4
17.4	22.5	24.7	25.7	24.8	23.4
18.2	22.8	24.8	25.8	24.5	23.4
18.9	23.2	25	25.8	24.3	23.4
19.6	23.4	25.1	25.8	24.1	23.4
20.2	23.6	25.2	25.8	23.9	23.5
20.6	23.8	25.4	25.8	23.8	23.5

Temp = 70°C : Original foam height = 10.7 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.1	20.9	24.9	26.2	25.5	24.7
13.5	21.3	25.1	26.2	25.4	24.7
14.9	21.9	25.4	26.2	25.3	24.7
16.1	22.4	25.6	26.1	25.2	24.6
17.1	22.9	25.8	26.1	25.1	24.6
17.9	23.4	25.9	26	25	24.6
18.7	23.8	26.1	25.9	24.9	24.6
19.2	24.1	26.2	25.8	24.9	24.6
19.8	24.4	26.2	25.7	24.8	24.6
20.3	24.8	26.2	25.6	24.8	24.6

Table D-3 Foam height of 0.5 vol% NP(EO)₉ at each temperature

Temp = 30°C : Original foam height = 10.8 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.4	23.5	29.6	33.2	34.9	35.6
14.2	24.2	30	33.4	35	35.6
15.8	24.8	30.5	33.6	35.1	35.7
17.1	25.5	31	33.8	35.1	35.8
18.4	26.1	31.4	34	35.2	35.9
19.6	26.7	31.8	34.1	35.3	35.9
20.5	27.4	32.1	34.2	35.3	35.9
21.3	27.9	32.3	34.4	35.4	36
22	28.5	32.7	34.6	35.5	36
22.8	29.1	32.9	34.8	35.6	36.1

Temp = 40°C : Original foam height = 10.9 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.1	23.2	29	32.9	34.8	35.6
13.9	23.8	29.5	33.2	34.9	35.7
15.5	24.4	30	33.4	35	35.8
16.8	25.1	30.5	33.6	35	35.8
18	25.8	30.9	33.8	35.1	35.9
19	26.4	31.3	34	35.2	35.9
20	26.9	31.7	34.2	35.3	36
20.8	27.5	32	34.4	35.3	36
21.6	28	32.3	34.5	35.4	36
22.5	28.5	32.6	34.7	35.6	36.1

Temp = 50°C : Original foam height = 10.9 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.3	22.8	27.5	30	31.1	31.4
14	23.4	27.8	30.1	31.1	31.4
15.6	23.9	28.2	30.3	31.1	31.4
16.9	24.5	28.5	30.5	31.1	31.4
18	25	28.7	30.6	31.1	31.4
19	25.4	29	30.7	31.2	31.3
19.9	25.9	29.2	30.8	31.2	31.3
20.7	26.3	29.4	30.9	31.3	31.3
21.5	26.7	29.7	31	31.5	31.2
22.2	27.2	29.9	31	31.4	31.2

Temp = 55°C : Original foam height = 10.6 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12	24.6	31.2	33	31.9	30.6
13.3	25.5	31.5	32.9	31.8	30.5
14.7	26.3	31.9	32.8	31.7	30.5
16.3	27	32.2	32.6	31.5	30.5
17.9	27.8	32.4	32.6	31.4	30.5
19.2	28.4	32.6	32.5	31.2	30.5
20.5	29.1	32.7	32.4	31.1	30.6
21.7	29.6	32.9	32.3	30.9	30.7
22.7	30.2	33	32.2	30.8	30.8
23.7	30.8	33	32	30.7	30.9

Temp = 60°C : Original foam height = 10.8 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.2	23.9	28.5	29.4	28.5	27.3
13.6	24.6	28.7	29.4	28.3	27.3
15	25.2	28.9	29.4	28.1	27.3
16.8	25.8	29	29.3	28	27.3
18.2	26.3	29.2	29.3	27.8	27.3
19.5	26.8	29.3	29.1	27.7	27.4
20.7	27.2	29.4	29	27.5	27.4
21.6	27.6	29.4	28.9	27.4	27.4
22.4	28	29.4	28.8	27.4	27.4
23.2	28.3	29.4	28.6	27.3	27.4

Temp = 70°C : Original foam height = 10.7 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.5	21.1	22.8	23.9	24.3	24.5
14.2	21.3	22.9	23.9	24.3	24.5
15.6	21.5	23	23.9	24.4	24.5
16.9	21.7	23.2	24	24.4	24.6
18	21.9	23.3	24.1	24.4	24.6
18.7	22.1	23.4	24.1	24.5	24.7
19.4	22.3	23.5	24.1	24.5	24.7
19.9	22.4	23.6	24.2	24.5	24.7
20.4	22.6	23.7	24.2	24.5	24.7
20.7	22.7	23.8	24.3	24.5	24.7

Table D-4 Foam height of 1.0 vol% NP(EO)₉ at each temperature

Temp = 30°C : Original foam height = 10.8 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12	23.2	29.2	32.9	34.9	35.3
13.7	23.9	29.7	33.2	35	35.3
15.1	24.6	30.1	33.5	35	35.3
16.3	25.3	30.4	33.7	35.2	35.3
17.6	25.9	30.9	33.9	35.2	35.3
18.7	26.5	31.3	34.2	35.2	35.3
19.8	27.1	31.7	34.3	35.2	35.4
20.7	27.6	31.9	34.5	35.2	35.5
21.6	28.2	32.1	34.7	35.2	35.5
22.4	28.8	32.5	34.8	35.2	35.5

Temp = 40°C : Original foam height = 10.9 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.4	22	27.5	31.2	32.9	33.9
13.9	22.7	27.9	31.4	33	33.9
15.2	23.3	28.4	31.7	33.2	34
16.3	23.9	28.9	31.8	33.3	34
17.3	24.5	29.2	32	33.4	34.1
18.2	25	29.6	32.2	33.5	34.2
19.1	25.5	29.9	32.4	33.6	34.2
19.9	26	30.2	32.6	33.7	34.3
20.6	26.5	30.5	32.7	33.7	34.4
21.3	27	30.9	32.8	33.8	34.4

Temp = 50°C : Original foam height = 10.6 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.2	22.2	27.2	29.9	31.2	32
14.1	22.8	27.6	30.1	31.3	32.1
15.3	23.4	27.9	30.3	31.4	32.2
16.6	24	28.3	30.5	31.5	32.2
17.6	24.5	28.6	30.6	31.5	32.3
18.5	25	28.9	30.8	31.6	32.4
19.4	25.5	29.1	30.9	31.7	32.4
20.1	26	29.3	31	31.8	32.4
20.9	26.5	29.5	31	31.9	32.4
21.6	26.9	29.7	31.1	32	32.4

Temp = 55°C : Original foam height = 10.8 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.4	25.8	31.6	32.7	31.6	30.9
14.2	26.6	31.9	32.7	31.5	30.9
16	27.5	32.1	32.7	31.4	31
17.2	28.2	32.3	32.5	31.2	31
18.5	28.8	32.5	32.4	31	31.1
20.1	29.4	32.6	32.2	31	31.1
21.5	30	32.7	32	31	31.1
22.7	30.4	32.7	31.9	31	31.1
23.9	30.9	32.7	31.8	30.9	31.1
24.8	31.3	32.7	31.7	30.9	31.1

Temp = 60°C : Original foam height = 11.1 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.2	25.3	30.4	32	31.5	30.4
13.8	26.1	30.6	31.9	31.3	30.4
15.8	26.7	30.9	31.9	31.1	30.4
17.7	27.3	31	31.9	31	30.5
19.2	27.9	31.2	31.8	30.9	30.6
20.5	28.4	31.4	31.7	30.9	30.7
21.6	28.9	31.7	31.7	30.9	30.7
22.7	29.3	31.8	31.7	30.7	30.7
23.5	29.7	31.9	31.7	30.6	30.8
24.4	30.1	32	31.7	30.5	30.8

Temp = 70°C : Original foam height = 10.8 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.3	23.1	26.5	27.4	27.1	26
14.3	23.6	26.7	27.5	27	25.9
15.9	24.1	26.9	27.5	26.9	25.9
17.3	24.5	27	27.5	26.7	25.9
18.5	24.9	27.1	27.5	26.6	25.9
19.5	25.3	27.2	27.5	26.4	25.9
20.4	25.6	27.3	27.4	26.3	25.9
21.1	25.9	27.3	27.3	26.1	25.9
21.9	26.1	27.4	27.2	26	26
22.5	26.3	27.4	27.2	26	26

Table D-5 Foam height of 0.01 vol% NP(EO)₁₀ at each temperature

Temp = 40°C : Original foam height = 11.3 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.5	22.7	27.2	29.1	29.1	28.6
13.8	23.3	27.5	29.2	29	28.5
15.3	23.9	27.7	29.2	29	28.5
16.4	24.4	28	29.3	29	28.5
17.7	24.9	28.2	29.3	28.9	28.5
18.5	25.4	28.3	29.3	28.9	28.5
19.4	25.8	28.4	29.3	28.8	28.4
20.3	26.2	28.6	29.3	28.7	28.3
21.1	26.6	28.8	29.2	28.6	28.3
21.8	26.9	28.9	29.2	28.6	28.3

Temp = 50°C : Original foam height = 10.7 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.8	21.9	27	28.5	28.8	28.5
13.5	22.6	27.3	28.6	28.7	28.5
14.8	23.3	27.5	28.8	28.6	28.5
15.9	24	27.6	28.8	28.62	28.5
17	24.5	27.8	28.8	28.4	28.5
18	25	28	28.9	28.4	28.5
18.9	25.6	28.1	28.9	28.4	28.5
19.7	26	28.2	28.9	28.5	28.5
20.5	26.4	28.3	28.9	28.5	28.5
21.2	26.7	28.4	28.9	28.5	28.5

Temp = 60°C : Original foam height = 11.2 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.3	21.9	25.9	27.2	27.1	26.7
14	22.5	26.1	27.3	27.1	26.7
15.6	23	26.3	27.3	27	26.7
16.9	23.5	26.5	27.2	27	26.7
17.9	24	26.6	27.2	27	26.6
18.6	24.4	26.7	27.2	27	26.6
19.4	24.8	26.8	27.2	26.9	26.6
20	25.1	27	27.1	26.9	26.5
20.6	25.4	27.1	27	26.8	26.5
21.3	25.7	27.2	27	26.8	26.5

Temp = 65°C : Original foam height = 10.9 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.1	22.2	26.9	28.3	27.8	27.2
13.9	22.8	27.2	28.3	27.8	27.2
15.4	23.5	27.4	28.2	27.7	27.2
16.8	24	27.5	28.2	27.7	27.2
17.8	24.5	27.7	28.2	27.6	27.2
18.6	25.1	27.9	28.1	27.6	27.2
19.3	25.1	28.1	28.1	27.5	27.1
20.1	26	28.1	28.1	27.4	27.1
20.8	26.4	28.3	28	27.3	27
21.5	26.6	28.3	27.9	27.3	27

Temp = 70°C : Original foam height = 10.3 cm.

Foam height at each time					
10	20	30	40	50	60
11.4	21.9	26	27.1	26.3	25.9
13	22.5	26.3	27.1	26.3	25.9
14.5	23.1	26.5	27	26.2	25.8
15.7	23.6	26.7	27	26.2	25.8
16.8	24	26.8	27	26.1	25.8
17.9	24.5	26.9	26.9	26	25.7
18.8	24.9	27	26.8	26	25.7
19.6	25.2	27	26.7	26	25.7
20.4	25.5	27	26.6	25.9	25.7
21.2	25.8	27.1	26.5	25.9	25.7

Table D-6 Foam height of 0.1 vol% NP(EO)₁₀ at each temperature

Temp = 40°C : Original foam height = 11.7 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
13	22.7	27.7	30.9	32.8	33.7
14.7	23.3	28.1	31.2	32.8	33.7
16.1	23.9	28.5	31.5	33	33.7
17.2	24.5	28.8	31.7	33.1	33.8
18.2	25.1	29.2	31.8	33.2	33.9
19.1	25.5	29.5	32	33.3	33.9
19.9	26	29.9	32.2	33.4	34
20.7	26.4	30.1	32.4	33.5	34
21.3	26.9	30.4	32.5	33.5	34
22.1	27.3	30.6	32.6	33.6	34

Temp = 50°C : Original foam height = 11.3 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.7	22.9	28.4	31.4	31.2	31.2
14.4	23.5	28.9	31.5	31.2	31.2
15.9	24.1	29.4	31.6	31.2	31.2
17.2	24.7	29.7	31.6	31.2	31.2
18.2	25.1	30	31.7	31.2	31.2
19.2	25.7	30.4	31.7	31.2	31.2
20.1	26.3	30.6	31.8	31.2	31.2
20.8	26.9	30.8	31.7	31.1	31.2
21.5	27.5	31	31.5	31.1	31.2
22.2	28.1	31.2	31.2	31.1	31.2

Temp = 60°C : Original foam height = 10.6 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
11.9	21.4	25.2	26.7	26.9	27.2
13.5	22	25.4	26.7	26.9	27.3
15.1	22.4	25.6	26.7	26.9	27.3
16.1	22.9	25.8	26.8	26.9	27.3
17.5	23.3	25.9	26.8	26.9	27.4
18.4	23.7	26.1	26.9	26.9	27.5
19.1	24.2	26.3	26.9	27	27.5
19.7	24.5	26.4	26.9	27	27.5
20.3	24.8	26.5	26.9	27.1	27.5
20.9	25	26.6	26.9	27.1	27.5

Temp = 65°C : Original foam height = 11 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.2	23	26.3	27.7	28.1	28.2
14.2	23.4	26.5	27.8	28.1	28.2
15.8	23.8	26.7	27.8	28.1	28.2
17	24.2	26.9	27.9	28.1	28.2
18	24.6	27	27.9	28.2	28.2
19.2	24.9	27.1	27.9	28.2	28.2
20.3	25.2	27.2	28	28.2	28.1
21.1	25.5	27.4	28	28.2	28.1
21.8	25.8	27.5	28	28.2	28.1
22.4	26.1	27.6	28.1	28.2	28.1

Temp = 70°C : Original foam height = 10.5 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12	21.3	22.9	23.6	24.1	24.6
13.8	21.5	23	23.6	24.2	24.7
15	21.7	23.2	23.7	24.3	24.7
16.4	21.9	23.3	23.7	24.3	24.8
17.7	22.1	23.3	23.8	24.3	24.8
18.9	22.3	23.4	23.9	24.4	24.8
19.6	22.4	23.5	23.9	24.4	24.9
20.2	22.6	23.5	24	24.5	24.9
20.7	22.7	23.5	24	24.5	25
21	22.8	23.5	24.1	24.6	25

Table D-7 Foam height of 0.5 vol% NP(EO)₁₀ at each temperature

Temp = 40°C : Original foam height = 11.3 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.7	24.8	32	37.6	40.4	41.2
14.5	25.6	32.4	37.9	40.6	41.3
16.1	26.4	33.1	38.3	40.7	41.5
17.6	27.2	33.7	38.7	40.8	41.7
18.9	27.9	34.2	39.1	40.9	41.8
20	28.6	34.9	39.5	41	41.9
21	29.2	35.5	39.8	41	41.9
21.9	30.1	36	40.1	41	41.9
22.8	30.7	36.5	40.3	41	42.1
23.8	31.4	37.1	40.4	41.1	42.2

Temp = 50°C : Original foam height = 11.2 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.6	23.3	30.3	34.8	38	39.9
14.5	24	30.8	35.1	38.3	40.1
16.1	24.7	31.4	35.5	38.6	40.3
17.2	25.4	31.9	35.9	38.8	40.5
18.3	26.3	32.4	36.3	39.1	40.8
19.2	27.1	32.9	36.7	39.3	41.1
20.1	27.8	33.3	36.9	39.3	41.3
21	28.7	33.8	37.3	39.3	42.1
21.7	29.6	34.2	37.5	39.5	42.1
22.5	29.8	34.7	37.8	39.7	42.1

Temp = 60°C : Original foam height = 11.3 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.6	23.9	29.1	31.8	32.7	30.3
14.5	24.6	29.5	32	32.6	30
16.2	25.2	29.9	32.1	32.6	29.6
17.8	25.8	30.3	32.2	32.3	29.4
19	26.3	30.6	32.2	32.1	29.3
20.1	26.9	30.8	32.3	31.7	29.2
21	27.4	31	32.3	31.5	29
21.8	27.8	31.3	32.5	31.2	28.9
22.6	28.3	31.4	32.6	31	28.8
23.4	28.7	31.6	32.7	30.6	28.7

Temp = 65°C : Original foam height = 10.8 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.5	22	25.6	27.2	26.4	26.2
14.1	22.4	25.9	27.2	26.3	26.2
15.8	22.9	26.2	27.2	26.3	26.2
17	23.3	26.4	27.2	26.3	26.2
18.2	23.7	26.6	27.1	26.3	26.2
19	24	26.8	27	26.3	26.2
19.8	24.4	26.9	26.9	26.3	26.3
20.4	24.7	27	26.7	26.3	26.3
21	25	27.1	26.6	26.2	26.3
21.5	25.3	27.1	26.5	26.2	26.3

Temp = 70°C : Original foam height = 11.1 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.6	24.5	29.2	29.7	27.8	26.8
14.4	25.2	29.4	29.6	27.7	26.8
15.8	25.8	29.5	29.5	27.5	26.8
16.9	26.4	29.6	29.1	27.4	26.7
18.1	27.1	29.7	29	27.2	26.7
19.5	27.5	29.7	28.9	27.1	26.7
20.7	28	29.7	28.7	27	26.7
21.9	28.4	29.7	28.4	26.9	26.7
22.8	28.6	29.7	28.3	26.9	26.7
23.7	28.9	29.7	28.1	26.8	26.7

Table D-8 Foam height of 1.0 vol% NP(EO)₁₀ at each temperature

Temp = 40°C : Original foam height = 11 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.7	25	32.6	38.2	42.4	46.6
14.9	25.7	33.1	38.6	42.7	46.8
16.4	26.6	33.8	39	43.2	47.2
17.9	27.4	34.4	39.5	43.6	47.5
19.1	28.4	34.9	40	44	48.1
20.3	29	35.5	40.4	44.4	48.4
21.2	29.8	36.1	40.8	44.8	48.7
22.2	30.6	36.6	41.3	45.2	49
23.1	31.1	37.1	41.7	45.6	49.4
24.1	31.9	37.7	42	46.2	49.7

Temp = 50°C : Original foam height = 10.6 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.2	23.3	29.6	34.4	38.2	41.5
14.2	24	30.1	34.8	38.6	41.8
15.8	24.8	30.7	35.2	38.9	42.1
16.5	25.3	31.1	35.6	39.2	42.3
17.7	25.9	31.6	36	39.6	42.6
19	26.6	32.1	36.4	39.9	43
20	27.3	32.6	36.8	40.2	43.3
21	27.9	33	37.1	40.5	43.5
21.8	28.5	33.5	37.5	40.9	43.9
22.4	29.1	33.9	37.8	41.2	44.2

Temp = 60°C : Original foam height = 11.5 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.4	23.7	29.4	33.5	36.2	38.2
14.4	24.4	29.9	33.8	36.4	38.4
16	25.1	30.4	34.1	36.6	38.5
17.3	25.7	30.8	34.4	36.8	38.7
18.4	26.3	31.2	34.7	37	38.9
19.5	26.9	31.6	35	37.2	39.1
20.5	27.5	32	35.2	37.4	39.2
21.4	28	32.4	35.5	37.6	39.3
22.2	28.5	32.7	35.7	37.8	39.5
23	29	33.1	35.9	38	39.7

Temp = 65°C : Original foam height = 11 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.3	23	27.6	30	31.4	32.6
14.2	23.5	27.9	30.1	31.5	32.7
15.8	24.1	28.3	30.3	31.6	32.8
17	24.6	28.5	30.5	31.8	32.9
18.1	25.1	28.7	30.6	31.9	33
19	25.6	29	30.7	32	33.1
20	26.1	29.2	30.8	32.1	33.2
20.8	26.5	29.4	31	32.2	33.3
21.6	26.9	29.6	31.1	32.3	33.4
22.3	27.3	29.8	31.2	32.4	33.4

Temp = 70°C : Original foam height = 11.1 cm.

Foam height at each minute					
1-10	11-20	21-30	31-40	41-50	51-60
12.3	24.5	31.4	34.4	34.6	32.9
14.3	25.4	31.9	34.5	34.5	32.6
16	26.3	32.2	34.6	34.4	32.4
17.3	27.1	32.4	34.7	34.3	31.9
18.5	27.9	32.7	34.8	34.1	31.7
19.4	28.6	33.1	34.8	34	31.5
20.4	29.4	33.4	34.8	33.8	31.4
21.4	30	33.7	34.8	33.6	31.2
22.5	30.5	34	34.8	33.5	31.1
23.5	31	34.3	34.7	33.3	31

Table D-9 Foam Stability of 0.01 vol% NP(EO)₉ at each temperature

Temperature = 30°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	29.6
5	14.8	29.7
10	15.4	29.2
15	15.5	25.2
20	15.5	22.4
25	15.5	21.5
30	15.5	21

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.8	30.6
5	15.1	30.3
10	15.5	27.6
15	15.6	23.5
20	15.6	22.6
25	15.6	20.9
30	15.6	20.2

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	30.1
5	15.1	29.6
10	15.3	23
15	15.4	21
20	15.4	20.9
25	15.4	19.9
30	15.5	19.7

Temperature = 55°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	29.9
5	15	29.2
10	15.2	25.2
15	15.3	21.6
20	15.3	20.4
25	15.3	19.8
30	15.3	19.7

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.9	29.9
5	14.8	29
10	15	21.5
15	15	19.3
20	15	18.5
25	15	18.3
30	15	17.8

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.2	29
5	15	26.5
10	15	19.8
15	15	18.5
20	15	17.5
25	15	17
30	15	16.8

Table D-10 Foam Stability of 0.1 vol% NP(EO)₉ at each temperature

Temperature = 30°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.5	33.5
5	15.7	33.6
10	16.4	29.5
15	16.5	21.9
20	16.6	20.3
25	16.6	19.3
30	16.6	18.8

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	32.5
5	15.3	31.5
10	15.7	21.6
15	15.8	19.8
20	15.8	18.8
25	15.8	18.8
30	15.8	18

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.7	33
5	14.9	29.6
10	15.2	19.9
15	15.2	19.3
20	15.2	18.7
25	15.2	18.6
30	15.2	18.5

Temperature = 55°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	29.9
5	14.9	27.2
10	15	20.1
15	15.2	19.4
20	15.2	19.3
25	15.2	19.1
30	15.2	18.9

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12	27.2
5	14.1	24.9
10	14.2	19.2
15	14.3	18.4
20	14.3	18.2
25	14.3	17.6
30	14.4	17.6

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	29.2
5	15	23
10	15.1	18.6
15	15.1	18
20	15.1	17.4
25	15.1	17.3
30	15.1	17

Table D-11 Foam Stability of 0.5 vol% NP(EO)₉ at each temperature

Temperature = 30°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.5	39.7
5	15.3	39.7
10	16.1	39.7
15	16.2	35.6
20	16.2	23
25	16.2	20.9
30	16.3	19.6

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.5	39.9
5	15.4	39.9
10	15.9	39.7
15	16	21.8
20	16	18.8
25	16	18.3
30	16	18.3

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	35.2
5	15.2	35.4
10	15.5	18.9
15	15.5	17.4
20	15.5	18.3
25	15.5	18.2
30	15.5	17

Temperature = 55°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	34.9
5	15.5	26.3
10	15.8	18.1
15	15.8	17.5
20	15.8	17.3
25	15.8	17.1
30	15.8	17.1

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.7	31.9
5	15.2	23
10	15.3	17.4
15	15.3	17.4
20	15.3	17.2
25	15.3	17.1
30	15.3	17.1

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	29.2
5	14.9	17.1
10	14.9	16.1
15	14.9	15.8
20	14.9	15.7
25	14.9	15.6
30	14.9	15.4

Table D-12 Foam Stability of 1.0 vol% NP(EO)₉ at each temperature

Temperature = 30°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.5	37.9
5	14.8	38
10	15.6	38.1
15	15.8	38
20	15.8	24.5
25	15.9	20.5
30	15.9	20

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.4	38.1
5	15.3	38.3
10	15.9	38.3
15	16	19.3
20	16	18.7
25	16	17.8
30	16	17.7

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.9	36.3
5	15	36.6
10	15.3	17.8
15	15.3	17.7
20	15.3	17.1
25	15.3	17
30	15.3	16.9

Temperature = 55°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.6	35.1
5	15.7	21.1
10	16	18.1
15	16	17.6
20	16	17.5
25	16.1	17.3
30	16.1	17.1

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.5	35.3
5	15.5	22.3
10	15.6	18
15	15.6	17.6
20	15.6	17.5
25	15.6	17.3
30	15.6	17.1

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	30.4
5	15	17.3
10	15	16.4
15	15	16
20	15	15.8
25	15	15.7
30	15	15.7

TableD-13 Foam Stability of 0.01 vol%NP(EO)₁₀ at each temperature

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.5	32.5
5	15	32.4
10	15.6	26.3
15	15.7	20.1
20	15.7	19.4
25	15.7	19.4
30	15.7	19.2

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.3	32.5
5	14.9	32.4
10	15.2	23.8
15	15.2	20.7
20	15.2	20.7
25	15.2	19.8
30	15.3	19.8

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.6	30.7
5	14.9	29.7
10	15	21.1
15	15	20
20	15	19.2
25	15	19.1
30	15.1	18.7

Temperature = 65°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.8	31.6
5	15	30.1
10	15.2	21.6
15	15.2	20.1
20	15.2	20
25	15.2	18.3
30	15.2	16.7

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.7	30.3
5	14.5	27.2
10	14.7	20.8
15	14.7	18.9
20	14.7	17.2
25	14.7	15.9
30	14.7	15.6

Table D-14 Foam Stability of 0.1 vol% NP(EO)₁₀ at each temperature

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.9	37.8
5	15.7	37.6
10	16.2	19.7
15	16.2	18.6
20	16.2	18
25	16.2	17.7
30	16.2	17.6

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	35.4
5	15.2	22.9
10	15.4	17.8
15	15.4	17.1
20	15.4	17
25	15.5	17
30	15.5	17

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	11.8	31
5	14.4	22.3
10	14.5	18.2
15	14.6	18.1
20	14.6	17.8
25	14.6	17.7
30	14.6	17.5

Temperature = 65°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.5	32.5
5	15.2	27.3
10	15.3	19.5
15	15.3	18.6
20	15.3	18.5
25	15.3	17.9
30	15.3	17.9

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	29.6
5	14.6	22.9
10	14.7	17.9
15	14.7	17.2
20	14.7	17.2
25	14.7	17.2
30	14.7	16

Table D-15 Foam Stability of 0.5 vol% NP(EO)₁₀ at each temperature

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.5	45.3
5	15.8	42.2
10	16.1	27.5
15	16.2	19.7
20	16.7	18.9
25	16.7	18.3
30	16.7	18.3

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	11	44.8
5	15.7	39.9
10	16	18.7
15	16	17.5
20	16	17
25	16	16.9
30	16	16.7

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	10.6	31.2
5	14.5	17.3
10	14.5	15.5
15	14.5	15.3
20	14.5	15.3
25	14.6	15.2
30	14.6	15.1

Temperature = 65°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.5	30.1
5	15.1	18.4
10	15.1	17.1
15	15.1	16.5
20	15.1	16.5
25	15.1	16.4
30	15.1	16.4

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	12.5	30.9
5	14.9	22.6
10	14.9	17.3
15	14.9	16.5
20	14.9	16.3
25	14.9	16
30	15	15.9

Table D-16 Foam Stability of 1.0 vol% NP(EO)₁₀ at each temperature

Temperature = 40°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	9.5	52.5
5	16	52.9
10	17	52.9
15	17.1	24.8
20	17.2	19.8
25	17.2	18.7
30	17.3	18.6

Temperature = 50°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	10.8	47.7
5	15.5	47.8
10	15.8	22.8
15	15.9	17.5
20	15.9	17.1
25	15.9	17
30	15.9	16.9

Temperature = 60°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	43.8
5	15.5	22.9
10	15.8	17.1
15	15.8	16.7
20	15.8	16.6
25	15.8	16.4
30	15.8	16.3

Temperature = 65°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13.2	38
5	15.2	17.1
10	15.2	16.5
15	15.2	16.3
20	15.2	16.2
25	15.2	16
30	15.2	16

Temperature = 70°C

Foam stability		
Time	Foam height (cm)	
	soln	foam
0	-	-
1	13	35.3
5	15.4	17.9
10	15.4	17.2
15	15.4	17
20	15.4	16.8
25	15.4	16.6
30	15.4	16.4

**Appendix E : Comparison of concentrations of the surfactant solution
in different units**

Table E-1

Surfactants	MW	Density (g/cm ³)	Concentration		
			vol%	wt%	M
NP(EO) ₈	572	1.05	0.01	0.0105	0.0002
			0.1	0.1049	0.0018
			0.5	0.5247	0.0092
			1.0	1.0495	0.0184
NP(EO) ₉	616	1.06	0.01	0.0106	0.0002
			0.1	0.1059	0.0017
			0.5	0.5297	0.0086
			1.0	1.0594	0.0172
NP(EO) ₁₀	660	1.06	0.01	0.0106	0.0002
			0.1	0.1059	0.0016
			0.5	0.5297	0.0080
			1.0	1.0594	0.0161

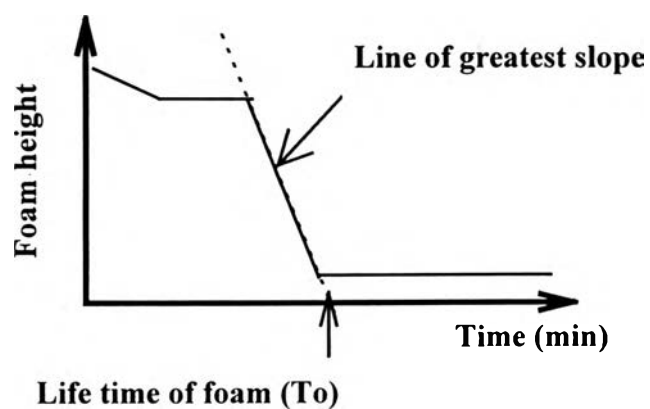
Appendix F : Life Time of Foam Data

Table F-1 Life time of foam data for NP(EO)₉ at each concentration
(Data taken from Figure 4.27-4.30)

Temp	Life time of foam (To)			
	0.01	0.1	0.5	1
30°C	26.8	18.5	22.7	23.2
40°C	18.3	12.9	16.6	15.9
50°C	15.7	12.4	11.0	10.7
55°C	21.9	13.5	8.9	6.3
60°C	14.2	14.3	7.7	6.7
70°C	13.6	8.9	5.6	5.6

Table F-2 Life time of foam data for NP(EO)₁₀ at each concentration
(Data taken from Figure 4.31-4.34)

Temp	Life time of foam (To)			
	0.01	0.1	0.5	1
40°C	18.0	11.0	13.8	16.4
50°C	14.8	7.1	10.6	11.4
60°C	13.5	7.8	5.6	6.3
65°C	13.7	12.7	5.9	5.3
70°C	14.6	9.0	7.9	5.5



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