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Appendices

Appendix 1

Microemulsion initiatory solution formula:

CTAB/SDS	1.75 g
2-Propanol	1.25 g
Water	95.75 g
AIBN	0.125 g
Benzene	1.125 g
Total	100.00 g

Molecular weight of AIBN =164

So, in initiatory solution contained AIBN 0.00076 mol

Molecular weight of potassium persulfate =270

So, 0.00076 mol of potassium persulfate =0.205g

Therefore, preparation of potassium persulfate 0.205 g in 100 g of distilled water contained initiator as both cationic and anionic microemulsion initiatory solution.

Appendix 2

Raw data of Table4.1

Immersing time (min)	Repeat no.	Wt. of fabric before polymerization (g)	Wt. of fabric after polymerization (g)	%add-on	%add-on (ave)
30	1	4.4637	4.4967	0.73	0.77
	2	4.7642	4.8028	0.81	
60	1	4.3249	4.3793	1.25	1.31
	2	4.9976	5.0667	1.38	
90	1	4.5667	4.6781	2.39	2.32
	2	4.2947	4.3919	2.26	
120	1	4.5699	4.7628	4.22	4.35
	2	4.8861	5.1055	4.49	
180	1	4.2491	4.4428	4.55	4.61
	2	4.6003	4.8154	4.67	
240	1	4.4461	4.6403	4.36	4.46
	2	4.7425	4.9589	4.56	

Appendix 3

Raw data of table 4.3 and 4.6

Liquor ratio	Repeat no.	Wt. of fabric before polymerization (g)	Wt. of fabric after polymerization (g)	%add-on	%add-on (ave)
20:1	1	4.5472	4.7239	3.88	4.03
	2	4.3275	4.5084	4.18	
30:1	1	4.7567	4.9551	4.17	4.37
	2	4.2521	4.4471	4.58	
40:1	1	4.3833	4.5915	4.74	4.64
	2	4.5547	4.7617	4.54	

Appendix 4

Raw data of Table 4.4, 4.5 and 4.6

Initiatory solution	Time of polymerization (hr)	Repeat no.	Wt. of fabric before polymerization (g)	Wt. of fabric after polymerization (g)	%add-on	%add-on (ave)
SDS	1	1	4.2748	4.2768	0.04	0.05
		2	4.6936	4.6965	0.06	
	2	1	4.3347	4.3353	0.01	0.03
		2	4.5764	4.5788	0.05	
	3	1	4.7716	4.8872	2.42	2.37
		2	4.2294	4.3276	2.32	
	4	1	4.5976	4.7443	3.19	3.05
		2	4.4948	4.6257	2.91	
$K_2S_2O_8$	1	1	4.3310	4.3315	0.01	0.01
		2	4.1006	4.1011	0.01	
	2	1	4.5576	4.6968	3.05	3.10
		2	4.4987	4.6405	3.15	
	3	1	4.3758	4.5894	4.88	4.70
		2	4.6163	4.8251	4.52	
	4	1	4.7230	4.9924	5.70	5.36
		2	4.4141	4.6358	5.02	

Appendix 5 Raw data of table 4.6

1) Untreated cotton

Sample	Dry wt. (g)	Original wt. (g)	%moisture regain
1	4.9131	5.1115	4.03
2	4.6318	4.8203	4.06

%moisture regain (ave) = 4.045 %

2) fabrics treated with cationic microemulsion initiatory solution (CTAB) and polymerized

sample	Wt. of dry treated fabrics (g)	Wt. of original treated fabrics (g)	%moisture regain
1	4.5915	4.7994	4.52
2	4.7617	4.9755	4.48

%moisture regain (ave) = 4.5 %

3) fabrics treated with anionic microemulsion initiatory solution (SDS) and polymerized

sample	Wt. of dry treated fabrics (g)	Wt. of original treated fabrics (g)	%moisture regain
1	4.8872	5.0919	4.18
2	4.3276	4.5097	4.20

%moisture regain (ave) =4.19 %

4) fabrics treated with potassium persulfate initiatory solution and polymerized

sample	Wt. of dry treated fabrics (g)	Wt. of original treated fabrics (g)	%moisture regain
1	4.5894	4.8133	4.87
2	4.8251	5.0595	4.85

%moisture regain (ave) = 4.86 %

Appendix 6 data of table 4.9 compare with untreated fabrics

Technique of Modification	Dye concentration (%o.w.f.)	Light Fastness
CTAB-benzene/propanol-water system	1	3
	2	3-4
	3	4
	4	4
CTAB-benzene/propanol-water system dyed with ASTRAZON RED 5BL	2	2-3
SDS-benzene/propanol-water system	2	4
Graft polymerization	2	4
Untreated fabric	1	3-4
	2	4
	3	4-5
	4	4-5

Appendix 7 ΔE value of sample from table 4.10

Washing fastness assessment of the treated and untreated fabrics dyed with various concentration of dyes by using I.C.S. Macbeth Spectrophotometer (as the color different ΔE)

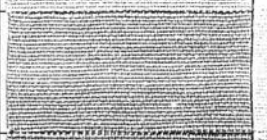
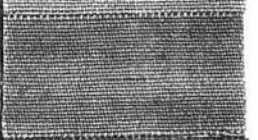
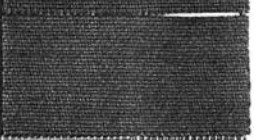
Method of treatment	Concentration of dye	Color Change	Color staining[(a)](ΔE)					
			Ac	C	N	P	A	W
Microemulsion base on CTAB-benzene/propanol-water system	1	9.750	24.119	35.256	25.998	39.722	41.649	33.658
	2	10.165	21.902	39.860	27.539	46.038	47.830	36.599
	3	11.142	28.701	41.646	31.829	52.112	57.674	45.327
	4	13.683	28.673	44.634	29.235	49.552	51.099	35.266
	2*	12.384	27.498	40.976	45.908	38.563	30.609	37.690
Microemulsion base on SDS-benzene/propanol-water system	2	17.597	32.884	44.140	32.066	46.491	49.168	39.958
Graft polymerization	2	17.382	33.096	45.231	37.101	47.190	50.109	40.863
Untreated fabric	1	19.483	21.481	26.017	20.615	24.438	26.222	24.704
	2	23.811	26.590	32.652	25.115	30.819	33.533	30.736
	3	23.522	26.925	34.505	26.627	33.304	35.739	32.434
	4	22.690	28.678	34.636	27.365	32.279	34.920	30.948

Sample dyed with ASTRAZON BLUE FGLN

* Sample dyed with ASTRAZON RED 5BL

(a) Ac = Acetate adjacent
C = Cotton adjacent
N = Nylon 6,6 adjacent
P = Polyester adjacent
A = Acrylic adjacent
W = Wool adjacent

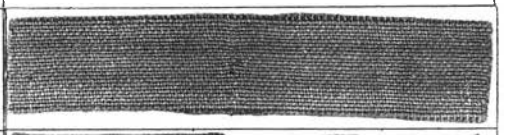
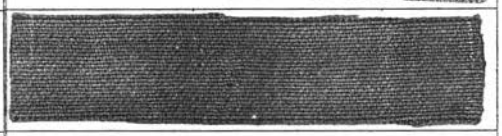
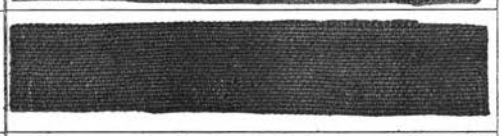
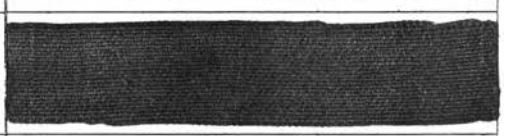
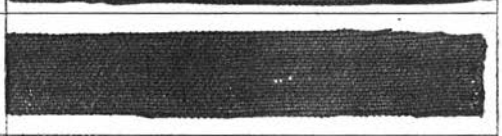
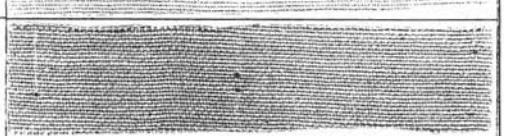
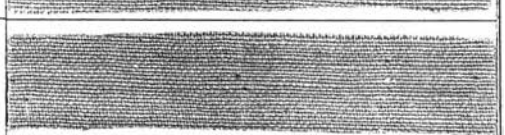
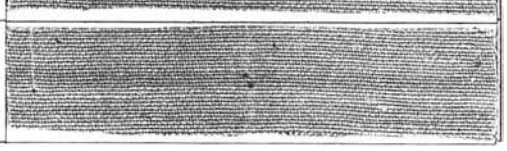
Appendix 8

Method of treatment	Concentration of dye (o.w.f.)	Sample before washing test	Sample after washing test
Untreated cotton	–		
	1		
	2		
	3		
	4		
microemulsion base on CTAB-benzene/propanol-water system	1		
	2		
	3		
	4		
	2*		
microemulsion base on SDS-benzene/propanol-water system	2		
Graft polymerization	2		

Sample dyed with ASTRAZON BLUE FGLN

* Sample dyed with 2% ASTRAZON RED 5BL

Appendix 9

Method of treatment	Concentration of dye	Light fastness test
Microemulsion base on CTAB-benzene/propanol-water system	1	
	2	
	3	
	4	
	2*	
Microemulsion base on SDS-benzene/propanol-water system	2	
Graft polymerization	2	
Untreated fabric	1	
	2	
	3	
	4	

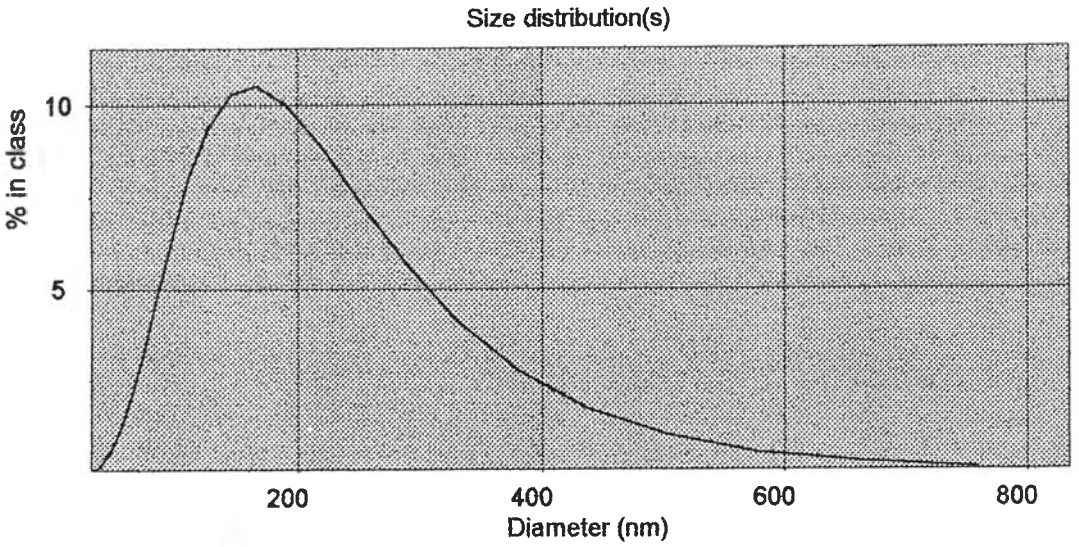
Sample dyed with ASTRAZON BLUE FGLN

* Sample dyed with ASTRAZON RED 5BL

microemulsion

File data from Live size Record 3
S4700
Data taken on 20/01/100 at 11:22:52
Merit 28.1 % In range 86.8 %
Temperature 30.0 Viscosity 0.800 cP Angle 90.0 deg
RI medium 1.33 RI particle 1.50 + Abs. 0.00

Cumulant Z Ave 161.5 nm Polydispersity 0.274



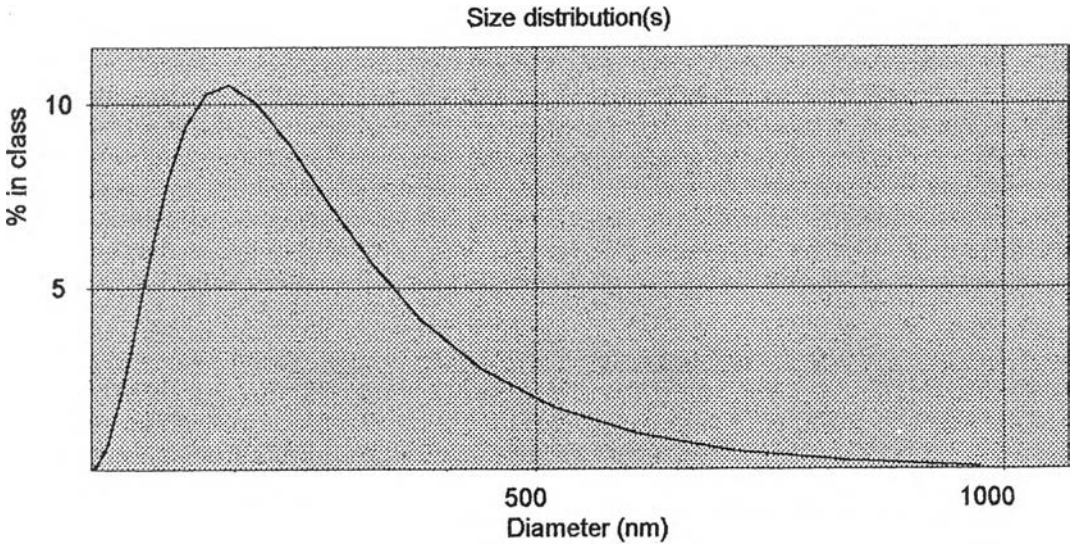
Size (nm)	% Intensity	Size (nm)	% Intensity	Size (nm)	% Intensity
31.7	0.1	95.7	6.4	288.9	5.7
36.4	0.2	109.9	8.0	331.6	4.1
41.8	0.4	126.2	9.4	380.7	2.8
48.0	0.7	144.9	10.3	437.1	1.7
55.1	1.3	166.3	10.5	501.8	1.0
63.3	2.1	190.9	10.0	576.1	0.6
72.6	3.3	219.2	8.9	661.4	0.3
83.4	4.8	251.6	7.4	759.3	0.1

Peak : Mean 184.5 width 213.2 ,
Analysis Monomodal Fit 0.001618

microemulsion

File data from Live size Record 1
S4700
Data taken on 20/01/100 at 11:11:28
Merit 28.9 % In range 85.4 %
Temperature 30.0 Viscosity 0.800 cP Angle 90.0 deg
RI medium 1.33 RI particle 1.50 + Abs. 0.00

Cumulant Z Ave 167.3 nm Polydispersity 0.357



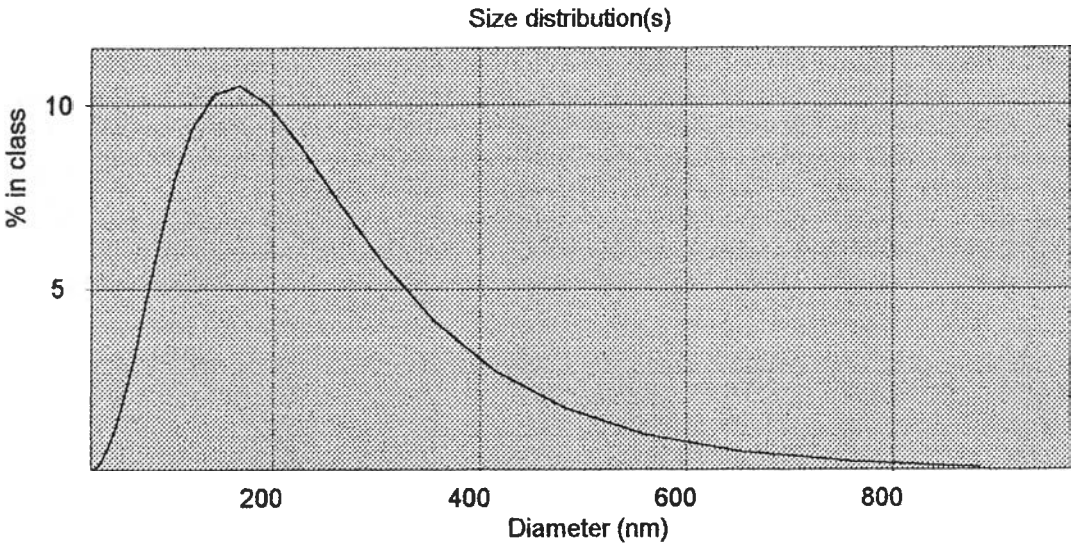
Size (nm)	% Intensity	Size (nm)	% Intensity	Size (nm)	% Intensity
26.1	0.1	91.8	6.4	323.4	5.7
30.5	0.2	107.5	8.0	378.5	4.1
35.7	0.4	125.8	9.4	443.0	2.8
41.8	0.7	147.2	10.3	518.5	1.8
48.9	1.3	172.3	10.5	606.9	1.0
57.3	2.1	201.7	10.0	710.4	0.6
67.0	3.3	236.1	8.9	831.5	0.3
78.4	4.7	276.3	7.4	973.2	0.1

Peak : Mean 199.0 width 256.8 ,
Analysis Monomodal Fit 0.001425

microemulsion

File data from Live size Record 2
S4700
Data taken on 20/01/100 at 11:17:10
Merit 28.4 % In range 87.3 %
Temperature 30.0 Viscosity 0.800 cP Angle 90.0 deg
RI medium 1.33 RI particle 1.50 + Abs. 0.00

Cumulant Z Ave 162.7 nm Polydispersity 0.329



Size (nm)	% Intensity	Size (nm)	% Intensity	Size (nm)	% Intensity
27.3	0.1	91.5	6.4	306.8	5.7
31.8	0.2	106.5	8.0	356.8	4.1
36.9	0.4	123.8	9.4	415.1	2.8
43.0	0.7	144.0	10.3	482.8	1.7
50.0	1.3	167.6	10.5	561.7	1.0
58.1	2.1	194.9	10.0	653.3	0.6
67.6	3.3	226.7	8.9	760.0	0.3
78.7	4.7	263.7	7.4	884.0	0.1

Peak : Mean 190.9 width 238.3 ,
Analysis Monomodal Fit 0.001995

BIOGRAPHY

Mr. Sombat Yongsupamongkol was born in Bangkok, Thailand, on September 20, 1972. He received a Bachelor of Engineering degree with a major in Textile Chemistry Engineering from Rajamangala Institute of Technology in 1997. He started as a graduate student in the Department of Materials Science with a major in Applied Polymer Science and Textile Technology, Chulalongkorn University in June 1998, and graduated in September 2000.