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APPENDICES

Appendix A Experimental Data of Microemulsion Formation

1. Interfacial tension (IFT)

The interfacial tension of each phase of microemulsion is calculated by following formulation :

$$\text{IFT} = e (Vd)^3 n^2 \Delta\rho \quad (\text{A.1})$$

Where

- $e = 3.427 \times 10^{-4} \text{ (mN cm}^3 \text{ min}^2/\text{m g mm}^3\text{)}$
- $V = 0.31 \text{ (mm/sdv)}$
- $d = \text{measured drop diameter (sdv)}$
- $n = \text{number of revolution (rpm)}$
- $\Delta\rho = \text{density difference of two liquids (g/cm}^3\text{)}$

2. Experimental data of interfacial tension

Table A-1 Interfacial tension as a function of MES concentration at an oil to water volumetric ratio of 1:1

Concentration	top	bottom	d (mm)	speed(n) (rpm)	ρ heavy (g/mL)	ρ light (g/mL)	$\Delta\rho$	IFT (mN/m)
0.1	5.795	1.705	4.09	2331	1.0035	0.87592	0.12758	0.48458
0.2	5.805	1.745	4.06	2304	1.0089	0.89048	0.11842	0.459879
0.5	6	1.555	4.445	1927	1.0096	0.89082	0.11878	0.39478
1.0	5.69	1.765	3.925	2221.5	1.0125	0.89202	0.12048	0.367236
2.0	5.735	1.965	3.77	1873.5	1.018	0.88888	0.12912	0.253232
4.0	5.7	1.735	3.965	2260	1.0123	0.89132	0.12098	0.393186
5.0	6.08	1.545	4.535	1866	1.011	0.8794	0.1316	0.42954
6.0	5.975	1.705	4.27	2218	1.0149	0.898	0.1169	0.457661
8.0	6.045	1.495	4.55	2009	1.024	0.90448	0.11952	0.4651
10.0	6.045	1.51	4.535	1998.5	1.0331	0.88582	0.14728	0.559837

Table A-2 Interfacial tension as a function of NaCl concentration with the concentration of 2 % MES at an oil to water volumetric ratio 1:1

Salinity concentration	top	bottom	d (mm)	speed(n) (rpm)	ρ heavy (g/mL)	ρ light (g/mL)	$\Delta\rho$	IFT (mN/m)
0.0	5.252	2.202	3.050	3012	1.00840	0.87500	0.13340	0.2532
0.1	5.352	2.025	3.327	3412	1.00156	0.92460	0.07696	0.2379
0.2	5.391	1.968	3.423	3458	0.9974	0.92752	0.06988	0.2431
0.3	5.332	2.151	3.181	3310	1.01396	0.91900	0.09496	0.2452
0.4	5.390	2.092	3.298	3089	1.01548	0.92060	0.09488	0.2338
0.5	5.381	1.992	3.389	3187	1.01460	0.92780	0.08680	0.2476
0.6	5.342	2.397	2.945	3650	1.01576	0.91504	0.10072	0.2417
0.7	5.502	2.277	3.225	3569	1.01056	0.93056	0.08000	0.2239
0.8	5.445	2.276	3.169	3722	1.00144	0.92672	0.07472	0.2401
0.9	5.285	2.255	3.030	3856	1.00020	0.91900	0.08120	0.2382
1.0	5.452	2.072	3.380	3120	1.01684	0.92476	0.09208	0.2312

Table A-3 Interfacial tension as a function of Ethylene oxide groups and concentration of Alcohol ethoxylate at an oil to water volumetric ratio 1:1

Concentration	Interfacial tension (IFT) (mN/m)			
	3 EO group Alcohol ethoxylate	5 EO group Alcohol ethoxylate	7 EO group Alcohol ethoxylate	9 EO group Alcohol ethoxylate
0.5	0.23983	0.540644	0.310399	0.233737
1	0.362297	0.24026	0.207935	0.270019
5	0.293046	0.226789	0.262657	0.216107
10	0.166589	0.13211	0.186757	0.347024
15	0.052286	0.128736	0.278988	0.297804

Table A-4 Interfacial tension of mixed surfactant system as a function AE3/MES weight ratios at an oil to water volumetric ratio 1:1

AE3/MES weight ratios	top	bottom	d (mm)	speed(n) (rpm)	ρ heavy (g/mL)	ρ light (g/mL)	$\Delta\rho$	IFT (mN/m)
100/0	5.216	2.435	2.781	2174	0.99670	0.93460	0.06210	0.0523
96.77/3.23	5.225	2.526	2.699	2324	0.98520	0.92420	0.06100	0.0462
93.75/6.25	5.480	2.682	2.798	2140	0.97665	0.91490	0.06175	0.0418
88.23/11.23	5.111	2.293	2.818	2625	1.01035	0.96625	0.04410	0.0341
83.33/16.67	5.398	2.699	2.699	2100	1.00305	0.93550	0.06755	0.0382
75/25	5.290	2.695	2.595	2008	1.00040	0.92505	0.07535	0.0423
71.43/28.57	5.311	2.442	2.869	2405	1.01020	0.96140	0.04880	0.0583
60/40	5.443	2.352	3.091	2500	1.01765	0.98155	0.03610	0.0682
50/50	5.343	2.475	2.868	2200	1.01150	0.95880	0.05270	0.0942
33.33/66.67	5.324	2.433	2.891	2412	0.98540	0.93860	0.04680	0.1018
20/80	5.267	2.504	2.763	2385	0.99915	0.94590	0.05325	0.1162
0/100	5.735	1.965	3.77	1873.5	1.018	0.88888	0.12912	0.253232

Table A-5 Interfacial tension of the selected system (88.23/11.77 of AE3/MES) as a function of salinity at an oil to water volumetric ratio 1:1

Salinity concentration	top	bottom	d (mm)	speed(n) (rpm)	ρ heavy (g/mL)	ρ light (g/mL)	$\Delta\rho$	IFT (mN/m)
0.1	5.241	2.648	2.593	3987	0.98945	0.92185	0.06760	0.0342
0.2	5.227	2.554	2.673	3367	1.01250	0.94920	0.06330	0.0331
0.3	5.147	2.429	2.718	2959	0.98710	0.92085	0.06625	0.0326
0.4	5.302	2.610	2.692	3142	1.00275	0.94355	0.05920	0.0345
0.5	5.311	2.648	2.663	3185	0.99935	0.93865	0.06070	0.0323
0.6	5.330	2.605	2.725	3354	1.00730	0.95810	0.04920	0.0349
0.7	5.313	2.554	2.759	3260	1.00485	0.95530	0.04955	0.0344
0.8	5.307	2.563	2.744	3288	1.02445	0.97610	0.04835	0.0322
0.9	5.295	2.677	2.618	3307	0.99270	0.93435	0.05835	0.035
1.0	5.315	2.722	2.593	3489	0.99225	0.93985	0.05240	0.0338

Table A-6 Interfacial tension of the selected system (88.23/11.77 of AE3/MES) as a function of active concentration at an oil to water volumetric ratio 1:1

Active concentration	top	bottom	d (mm)	speed(n) (rpm)	ρ heavy (g/mL)	ρ light (g/mL)	$\Delta\rho$	IFT (mN/m)
0.1	5.241	2.648	2.593	3987	0.98945	0.92185	0.06760	0.12084
0.2	5.227	2.554	2.673	3367	1.01250	0.94920	0.06330	0.09577
0.3	5.147	2.429	2.718	2959	0.98710	0.92085	0.06625	0.0431
0.4	5.302	2.610	2.692	3142	1.00275	0.94355	0.05920	0.0355
0.5	5.311	2.648	2.663	3185	0.99935	0.93865	0.06070	0.0334
0.6	5.330	2.605	2.725	3354	1.00730	0.95810	0.04920	0.0329
0.7	5.313	2.554	2.759	3260	1.00485	0.95530	0.04955	0.0341
0.8	5.307	2.563	2.744	3288	1.02445	0.97610	0.04835	0.0314
1.0	5.315	2.722	2.593	3489	0.99225	0.93985	0.05240	0.0342

Appendix B Experimental Data of Detergency Experiment

1. Detergency

The detergency performance can be determined by the following equation:

$$\text{Detergency (\%)} = [(A-B)/(C_0-B)] \times 100$$

where A = average reflectance of the soiled swatches after washing

B = average reflectance of the soiled swatches before washing

C₀ = average reflectance of the unsoiled swatches before washing

2. Oil Removal

The oil removal is calculated from the calibration curve for colored palm oil.

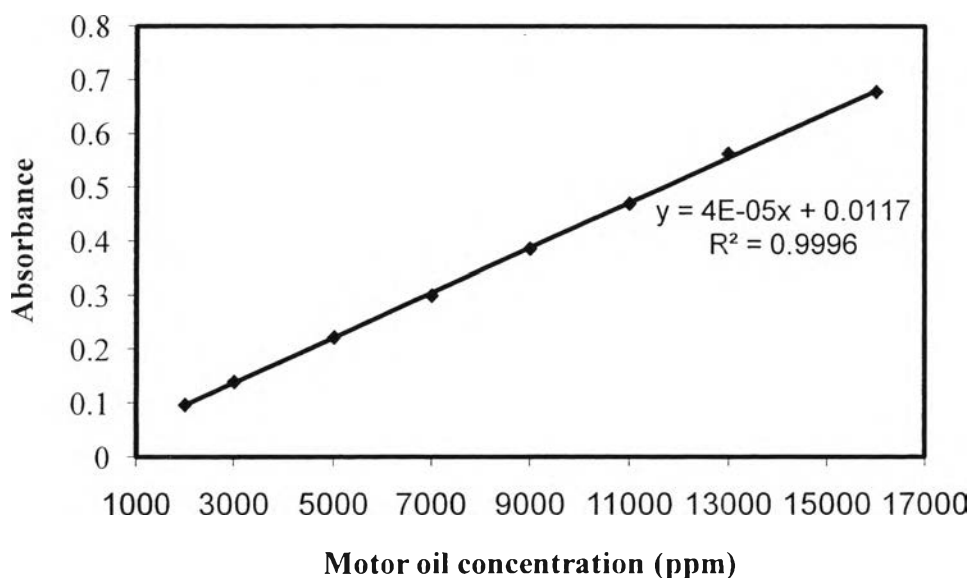


Figure B-1 Relationship between colored motor oil concentration and the absorbance measured at 520 nm

Table B-1 Relationship between colored motor oil concentration and the absorbance measured at 520 nm

Motor oil concentration (ppm)	Absorbance
2000	0.096
3000	0.139
5000	0.221
7000	0.299
9000	0.385
11000	0.469
13000	0.562
16000	0.677

3. Experimental data of detergency performance

Table B-2 Detergency (%) of pure MES system

MES concentration (%wt/v)	Sample No.	Reflectance of the unsoiled swatches before washing (Co)	Reflectance of the soiled swatches before washing (B)	Reflectance of the soiled swatches after washing (A)	Detergency (%)	Average Detergency
0	1	84.91	43.05	49.10	17.1323	17.1884
	2	84.89	43.05	49.19	17.4217	
	3	84.92	42.9	49.23	17.0113	
0.5	1	84.95	42.89	57.79	39.3854	38.4200
	2	84.82	43.22	57.16	37.6412	
	3	84.91	43.50	56.47	38.4100	
1	1	84.92	43.15	57.50	38.4887	38.6157
	2	84.95	43.87	57.55	38.8616	
	3	84.89	43.56	57.46	38.4968	
2	1	84.93	43.46	57.94	40.0071	40.9743
	2	84.88	43.28	58.10	40.6858	
	3	84.79	43.24	58.47	42.2301	
5	1	84.95	43.35	57.66	42.44	42.4900
	2	84.89	43.55	58.21	42.91	
	3	84.89	43.34	57.84	41.76	
10	1	84.80	43.57	58.85	42.6993	42.6800
	2	84.95	43.15	56.64	41.9393	
	3	84.87	43.87	58.98	43.9901	

Table B-3 Detergency (%) of pure AE3 system at different concentration

Surfactant concentration (%wt/v)	Sample No.	Reflectance of the unsoiled swatches before washing (Co)	Reflectance of the soiled swatches before washing (B)	Reflectance of the soiled swatches after washing (A)	Detergency (%)	Average Detergency
0	1	84.91	43.05	49.10	17.1323	17.1885
	2	84.89	43.05	49.19	17.4217	
	3	84.92	42.90	49.23	17.0113	
0.5	1	84.95	42.44	57.80	40.3818	40.7117
	2	84.82	43.02	58.87	40.4237	
	3	84.91	42.98	56.68	41.4885	
1	1	84.92	43.06	57.81	42.6130	41.9118
	2	84.95	43.33	59.41	41.3732	
	3	84.89	43.72	58.58	41.9287	
5	1	84.93	43.37	58.92	41.8503	43.1413
	2	84.88	43.30	59.52	44.7692	
	3	84.79	43.45	59.04	44.0619	
10	1	84.80	43.72	60.10	45.4186	45.2957
	2	84.95	44.30	60.67	46.1568	
	3	84.87	44.49	61.73	44.2305	
15	1	84.40	44.34	62.39	46.4186	47.1884
	2	84.75	44.78	61.83	47.1568	
	3	84.84	44.62	61.48	48.2305	

Table B-4 Detergency (%) of mixed surfactant system as a function of AE3/MES weight ratios.

AE3/MES weight ratio	Sample No.	Reflectance of the unsoiled swatches before washing (Co)	Reflectance of the soiled swatches before washing (B)	Reflectance of the soiled swatches after washing (A)	Detergency (%)	Average Detergency
100/0	1	84.91	43.34	59.10	48.1323	47.1884
	2	84.89	43.71	59.19	46.4217	
	3	84.92	43.32	59.23	47.1120	
96.77/3.23	1	84.99	42.77	66.71	51.6573	51.9000
	2	84.85	42.45	67.37	52.0100	
	3	84.89	42.72	66.35	51.2055	
93.75/6.25	1	84.93	42.43	66.975	52.3159	52.6973
	2	84.97	42.32	67.025	52.7046	
	3	84.85	42.55	66.575	53.0540	
88.23/11.77	1	84.95	42.44	69.52	57.0673	57.8464
	2	84.91	42.28	69.53	58.1742	
	3	84.90	42.09	68.85	57.7756	
83.33/16.67	1	84.52	42.74	68.39	56.2315	56.0193
	2	84.66	42.33	68.35	55.6328	
	3	84.49	42.48	68.61	56.2187	
75/25	1	84.86	42.44	67.51	52.9459	53.0330
	2	84.79	42.16	67.16	53.1460	
	3	84.92	42.79	66.89	52.9562	

Table B-4 Detergency (%) of mixed surfactant system as a function of AE3/MES weight ratios. (Cont.)

Surfactant concentration (%wt/v)	Sample No.	Reflectance of the unsoiled swatches before washing (Co)	Reflectance of the soiled swatches before washing (B)	Reflectance of the soiled swatches after washing (A)	Detergency (%)	Average Detergency
71.43/28.57	1	84.95	42.4	66.76	52.0142	51.8410
	2	84.82	42.47	66.86	52.2936	
	3	84.80	42.99	67.41	51.1212	
60/40	1	84.77	43.05	67.41	50.9236	51.4049
	2	84.96	43.05	67	50.8284	
	3	84.93	42.79	67.15	52.1946	
50/50	1	84.89	42.89	64.73	49.1623	49.4306
	2	84.82	43.22	64.22	48.7912	
	3	84.88	43.5	65.59	50.2972	
33.33/66.67	1	84.91	43.15	63.19	45.8864	45.8615
	2	84.93	43.87	62.64	46.0000	
	3	84.97	43.56	62.99	45.3588	
20/80	1	84.93	43.46	62.68	43.2192	44.1084
	2	84.87	43.28	63.78	44.6319	
	3	84.96	43.24	63.85	44.8251	
0/100	1	84.69	43.35	61.71	42.2327	42.3500
	2	84.73	43.55	60.72	42.0265	
	3	84.98	43.34	60.69	42.4830	

Table B-5 Detergency (%) of the selected formulation (88.23/11.77 of AE3/MES) as a function of active concentration

Active surfactant concentration (%wt/v)	Sample No.	Reflectance of the unsoiled swatches before washing (Co)	Reflectance of the soiled swatches before washing (B)	Reflectance of the soiled swatches after washing (A)	Detergency (%)	Average Detergency
0.0	1	84.91	43.05	49.10	17.1323	17.1185
	2	84.89	43.05	49.19	17.4217	
	3	84.92	42.90	49.23	17.0113	
0.1	1	84.91	40.29	57.18	38.1323	38.4052
	2	84.89	40.83	57.19	38.4217	
	3	84.92	40.88	57.23	38.7120	
0.2	1	84.89	40.78	61.16	47.2602	46.8810
	2	84.91	40.79	61.35	46.7781	
	3	84.87	41.67	61.08	46.8728	
0.3	1	84.90	41.26	76.29	83.6193	83.5103
	2	84.88	40.78	76.57	83.0826	
	3	84.93	41.08	76.62	83.8979	
0.4	1	84.85	40.78	74.41	60.3042	85.6465
	2	84.79	40.93	74.39	60.2750	
	3	84.91	40.94	74.33	59.5875	
0.5	1	84.85	40.68	74.37	60.1369	85.04842
	2	84.87	41.36	74.30	59.9924	
	3	84.91	41.19	74.29	59.7422	

Table B-5 Detergency (%) of the selected formulation (88.23/11.77 of AE3/MES) as a function of active concentration (**Cont.**)

Active surfactant concentration (%wt/v)	Sample No.	Reflectance of the unsoiled swatches before washing (Co)	Reflectance of the soiled swatches before washing (B)	Reflectance of the soiled swatches after washing (A)	%Detergency	Average Detergency
0.6	1	84.89	41.85	75.0400	60.5927	85.1830
	2	84.77	41.55	75.0100	60.5157	
	3	84.83	41.65	74.9700	60.2016	
0.7	1	84.94	41.74	75.4700	60.1901	85.3179
	2	84.91	41.65	75.7600	60.3361	
	3	84.89	41.37	75.7200	60.3972	
0.8	1	84.88	40.67	75.7700	60.0711	85.9383
	2	84.93	41.01	76.5900	60.3223	
	3	84.90	41.46	76.8000	61.3619	
1.0	1	84.88	41.42	76.2400	60.9254	86.1732
	2	84.91	42.02	77.1700	60.8315	
	3	84.90	41.9	77.0900	60.0222	

Table B-6 Oil Removal (%) of pure MES system at different concentration

Surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
0	1	11431.09	9104.13	20.3564	20.0100
	2	11837.18	9469.74	20.0019	
	3	12009.89	9647.34	19.6717	
0.5	1	11870.82	7075.53	40.5407	40.1254
	2	11635.14	7156.93	39.6365	
	3	11543.09	6925.85	40.0807	
1	1	11737.18	6790.57	41.6497	41.7114
	2	12209.89	7175.34	41.6903	
	3	11670.82	6798.59	41.7989	
2	1	11638.14	6535.06	43.8467	43.9552
	2	11676.02	6460.93	44.3252	
	3	11800.57	6570.64	43.8567	
5	1	11761.09	6468.55	45.0028	45.1811
	2	11891.18	6438.39	45.3854	
	3	12119.89	6476.99	45.2007	
10	1	12033.82	6459.75	46.3155	46.5537
	2	11764.14	6481.83	46.7349	
	3	11499.77	6421.96	46.6153	

Table B-7 Oil Removal (%) of pure AE3 system at different concentration

Surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
0	1	11431.09	9104.13	20.3564	20.0100
	2	11837.18	9469.74	20.0019	
	3	12009.89	9647.34	19.6717	
0.5	1	11675.81	6810.72	40.5407	41.0318
	2	11695.11	6790.57	41.6365	
	3	11592.39	6725.85	41.0807	
1	1	12138.38	6540.57	43.6497	43.9119
	2	12015.82	6575.34	44.3903	
	3	11470.82	6498.59	43.9989	
5	1	11873.14	6497.06	45.8467	45.8402
	2	11666.92	6510.93	45.3252	
	3	11841.52	6470.64	46.3567	
10	1	11481.33	6398.55	47.0028	47.0703
	2	11991.15	6420.39	46.7854	
	3	12349.19	6376.81	47.2007	
15	1	12221.72	6159.75	48.3155	48.7566
	2	11762.82	6051.83	48.7349	
	3	11682.13	5944.42	49.1153	

Table B-8 Oil removal (%) of mixed surfactant system as a function of AE3/MES weight ratios.

AE3/MES weight ratios	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
100/0	1	11632.04	6007.20	48.3564	48.7566
	2	11921.54	6079.75	49.0019	
	3	12128.49	6164.70	49.1717	
96.77/3.23	1	11642.86	2579.97	77.8407	78.1443
	2	11544.71	2489.44	78.4365	
	3	12118.34	2656.25	78.0807	
93.75/6.25	1	11628.71	2540.90	78.1497	78.1588
	2	12090.86	2623.68	78.3003	
	3	11820.22	2600.57	77.9989	
88.23/11.77	1	11763.39	1900.17	83.8467	83.5103
	2	11784.12	1964.97	83.3252	
	3	11499.19	1890.84	83.5567	
83.33/16.67	1	11931.03	2266.56	81.0028	81.0531
	2	11721.88	2252.31	80.7854	
	3	12189.48	2279.34	81.3007	
75/25	1	11921.22	2549.29	78.6155	78.8664
	2	12062.83	2565.17	78.7349	
	3	11792.97	2462.92	79.1153	

Table B-8 Oil removal (%) of mixed surfactant system as a function of AE3/MES weight ratios (**Cont.**)

Surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
71.43/28.57	1	11431.09	2617.98	77.0977	77.2869
	2	11837.18	2731.28	76.9262	
	3	12009.89	2667.86	77.7861	
60/40	1	11870.82	2924.98	75.3599	75.1201
	2	11635.14	2896.44	75.1061	
	3	11543.09	2880.84	75.0427	
50/50	1	11737.18	3365.27	71.3281	71.6249
	2	12209.89	3452.51	71.7236	
	3	11670.82	3286.38	71.8410	
33.33/66.67	1	11638.14	3981.47	65.7894	65.9753
	2	11676.02	3979.03	65.9213	
	3	11800.57	3957.82	66.4607	
20/80	1	11761.09	5002.78	57.4633	57.8247
	2	11891.18	4988.48	58.0489	
	3	12119.89	5099.06	57.9281	
0/100	1	12033.82	6803.52	43.4633	43.6519
	2	11764.14	6582.16	44.0489	
	3	11499.77	6505.63	43.4281	

Table B-9 Oil removal (%) of the selected formulation (88.23/11.77 of AE3/MES) as a function of active concentration

Active surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
0	1	11431.09	9104.13	20.3564	20.0100
	2	11837.18	9469.74	20.0019	
	3	12009.89	9647.34	19.6717	
0.1	1	12031.09	7443.25	38.1332	38.4052
	2	11811.68	7248.78	38.6304	
	3	11999.81	7385.61	38.4522	
0.2	1	11570.82	6215.60	46.2821	46.8810
	2	11689.14	6230.70	46.6966	
	3	12143.09	6355.15	47.6644	
0.3	1	11937.18	1987.01	83.3544	83.5103
	2	12054.88	1944.88	83.8664	
	3	12020.89	2006.27	83.3100	
0.4	1	11888.19	1718.91	85.541	85.6465
	2	11496.07	1620.12	85.9071	
	3	11930.52	1730.95	85.4913	

Table B-9 Oil removal (%) of the selected formulation (88.23/11.77 of AE3/MES) as a function of active concentration (**Cont.**)

Active surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
0.5	1	11832.04	1674.42	85.8484	85.0484
	2	11651.54	1750.00	84.9805	
	3	12118.49	1900.62	84.3163	
0.6	1	11942.86	1752.24	85.3281	85.1830
	2	11984.71	1808.84	84.9071	
	3	12097.34	1776.62	85.3139	
0.7	1	11838.71	1690.69	85.7189	85.3179
	2	11990.86	1809.76	84.9071	
	3	11620.22	1704.93	85.3278	
0.8	1	11593.39	1662.50	85.6599	85.9383
	2	12084.12	1755.37	85.4737	
	3	11899.19	1584.78	86.6815	
1.0	1	11649.03	1574.83	86.481	86.0031
	2	11799.88	1721.09	85.4143	
	3	12039.48	1672.92	86.1047	

Table B-10 Oil removal (%) of commercial detergent product as a function of active concentration

Active surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
0	1	11431.09	9104.13	20.3564	20.0100
	2	11837.18	9469.74	20.0019	
	3	12009.89	9647.34	19.6717	
0.1	1	11652.82	7735.94	33.6131	33.9143
	2	11985.14	7890.76	34.1621	
	3	11583.09	7648.57	33.9677	
0.2	1	11776.18	6518.12	44.6499	44.0013
	2	12047.89	6769.74	43.8097	
	3	11920.82	6729.95	43.5445	
0.3	1	11688.14	5719.77	51.0634	50.9478
	2	11936.02	5895.29	50.6092	
	3	11828.57	5775.77	51.1709	
0.4	1	11744.09	5542.29	52.8078	52.1698
	2	12122.18	5802.23	52.1354	
	3	12099.89	5860.42	51.5663	

Table B-10 Oil removal (%) of commercial detergent product as a function of active concentration (**Cont.**)

Active surfactant concentration (%wt/v)	Sample No.	Extracted soil before washing (ppm)	Residue soil after washing (ppm)	Soil removal (%)	Average soil removal (%)
0.5	1	11854.14	5385.64	54.5674	54.6433
	2	11837.86	5398.67	54.3948	
	3	11889.89	5354.28	54.9677	
0.6	1	12131.09	5457.59	55.0115	54.8262
	2	11691.68	5318.06	54.5141	
	3	11913.81	5366.80	54.9530	
0.7	1	11840.82	5309.29	55.1611	55.1668
	2	11589.14	5183.27	55.2747	
	3	11993.09	5389.13	55.0646	
0.8	1	11911.18	5288.70	55.5988	55.8983
	2	12159.88	5383.20	55.7298	
	3	11673.89	5093.72	56.3665	
1.0	1	11378.19	5007.07	55.9941	56.0120
	2	11996.07	5263.65	56.1218	
	3	11924.52	5256.31	55.9201	

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