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APPENDICES

APPENDIX A

Table A-1 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 6\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.300	2.5	0.0076	3.450	0.3203	6.4	3.5	2.9	0	I
0.400	2.5	0.0100	3.450	0.3203	6.4	3.7	2.7	0	I
0.500	2.5	0.0125	3.450	0.3203	6.4	4.8	1.6	0	I
0.517	2.5	0.0130	3.450	0.3203	6.4	5.0	1.4	0	I
0.541	2.5	0.0136	3.450	0.3203	6.4	5.0	1.4	0	I
0.560	2.5	0.0141	3.450	0.3203	6.4	6.1	0.1	0.2	III
0.580	2.5	0.0146	3.450	0.3203	6.4	6.1	0.2	0.1	III
0.596	2.5	0.0150	3.450	0.3203	6.4	5.3	0.2	0.9	III
0.620	2.5	0.0156	3.450	0.3203	6.4	5.7	0.3	0.4	III
0.639	2.5	0.0161	3.450	0.3203	6.4	0.5	5.9	0	II
0.659	2.5	0.0166	3.450	0.3203	6.4	0.9	4.5	0	II
0.679	2.5	0.0171	3.450	0.3203	6.4	1.1	5.3	0	II
0.700	2.5	0.0176	3.450	0.3203	6.4	1.0	5.4	0	II

Table A-2 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 7\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.300	2.5	0.0075	3.450	0.3775	6.4	3.8	2.6	0	I
0.400	2.5	0.0100	3.450	0.3775	6.4	4.2	2.2	0	I
0.500	2.5	0.0125	3.450	0.3775	6.4	5.5	0.9	0	I
0.521	2.5	0.0131	3.450	0.3775	6.4	5.7	0.7	0	I
0.541	2.5	0.0136	3.450	0.3775	6.4	5.8	0.6	0	I
0.560	2.5	0.0141	3.450	0.3775	6.4	6.1	0.1	0.2	III
0.580	2.5	0.0146	3.450	0.3775	6.4	6.1	0.2	0.1	III
0.600	2.5	0.0150	3.450	0.3775	6.4	0.2	6.2	0	II
0.700	2.5	0.0176	3.450	0.3775	6.4	0.8	5.6	0	II

Table A-3 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 7.5\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.521	2.5	0.0131	3.450	0.4075	6.4	6.0	2.6	0	I
0.541	2.5	0.0136	3.450	0.4075	6.4	6.2	0.1	0.10	III
0.560	2.5	0.0141	3.450	0.4075	6.4	0.1	6.3	0	II
0.580	2.5	0.0146	3.450	0.4075	6.4	0.3	6.1	0	II

Table A-4 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 8\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.300	2.5	0.0076	3.450	0.4361	6.5	4.3	2.2	0	I
0.400	2.5	0.0100	3.450	0.4361	6.5	4.6	1.9	0	I
0.500	2.5	0.0125	3.450	0.4361	6.5	6.4	0.1	0	I
0.521	2.5	0.0131	3.450	0.4361	6.5	6.4	0.1	0	I
0.541	2.5	0.0136	3.450	0.4361	6.5	6.5	0	0	IV
0.560	2.5	0.0141	3.450	0.4361	6.5	6.5	0	0	IV
0.580	2.5	0.0146	3.450	0.4361	6.5	0.1	6.4	0	II
0.596	2.5	0.0150	3.450	0.4361	6.5	0.1	6.4	0	II
0.700	2.5	0.0176	3.450	0.4361	6.5	0.9	5.6	0	II

Table A-5 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 8.5\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.300	2.5	0.0075	3.450	0.4660	6.5	4.3	2.2	0	I
0.400	2.5	0.0100	3.450	0.4660	6.5	4.7	1.8	0	I
0.521	2.5	0.0131	3.450	0.4660	6.5	0.1	6.4	0	II
0.580	2.5	0.0146	3.450	0.4660	6.5	0.3	6.2	0	II
0.596	2.5	0.0150	3.450	0.4660	6.5	0.4	6.1	0	II
0.700	2.5	0.0176	3.450	0.4660	6.5	0.9	5.6	0	II

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Table A-6 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 9\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.300	2.5	0.0075	3.450	0.4960	6.5	4.5	2.0	0	I
0.400	2.5	0.0100	3.450	0.4960	6.5	4.9	1.6	0	I
0.497	2.5	0.0125	3.450	0.4960	6.5	5.8	0.7	0	I
0.521	2.5	0.0131	3.450	0.4960	6.5	6.5	0	0	IV
0.541	2.5	0.0136	3.450	0.4960	6.5	6.5	0	0	IV
0.560	2.5	0.0141	3.450	0.4960	6.5	0.1	6.4	0	II
0.580	2.5	0.0146	3.450	0.4960	6.5	0.1	6.4	0	II
0.596	2.5	0.0150	3.450	0.4960	6.5	0.2	6.3	0	II
0.700	2.5	0.0176	3.450	0.4960	6.5	0.8	5.7	0	II

Table A-7 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 9.5\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.461	2.5	0.0116	3.450	0.5273	6.5	6.0	0.5	0	I
0.477	2.5	0.0120	3.450	0.5273	6.5	6.5	0	0	IV
0.541	2.5	0.0135	3.450	0.5273	6.5	0.3	6.2	0	II

Table A-8 Water / aerosol OT / n-decane microemulsion phase behavior at 45 °C for $\gamma = 10\%$ weight and $\alpha = 50\%$ weight

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase (ml.)	Volume of oil phase (ml)	Volume of water phase (ml)	Microemulsion Type
0.300	2.5	0.0075	3.450	0.5583	6.5	5.3	1.2	0	I
0.438	2.5	0.0110	3.450	0.5583	6.5	6.0	0.5	0	I
0.457	2.5	0.0115	3.450	0.5583	6.5	6.3	0.2	0	I
0.477	2.5	0.0120	3.450	0.5583	6.5	6.5	0	0	IV
0.497	2.5	0.0125	3.450	0.5583	6.5	6.5	0	0	IV
0.521	2.5	0.0131	3.450	0.5583	6.5	6.5	0	0	IV
0.541	2.5	0.0136	3.450	0.5583	6.5	0.1	6.4	0	II
0.560	2.5	0.0141	3.450	0.5583	6.5	0.1	6.4	0	II
0.580	2.5	0.0146	3.450	0.5583	6.5	0.2	6.3	0	II
0.700	2.5	0.0176	3.450	0.5583	6.5	0.6	5.9	0	II

APPENDIX B

First preparation of microemulsion type I

Table B-1 Water/aerosol OT/n-decane microemulsion phase behavior at 45°C for adsorption and adsolubilization experiment

$\alpha = 50\%$, $\gamma = 6\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.5121	6.5	3.3	2.4
0.400	4.0	0.0161	5.500	0.5121	6.5	3.5	2.5
0.500	4.0	0.0201	5.500	0.5121	6.5	4.1	2.7
0.541	4.0	0.0218	5.500	0.5121	6.5	4.8	3.2

$\alpha = 50\%$, $\gamma = 7\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.6045	6.5	3.5	2.5
0.400	4.0	0.0161	5.500	0.6045	6.5	3.9	2.6
0.500	4.0	0.0201	5.500	0.6045	6.5	5.0	3.3
0.541	4.0	0.0218	5.500	0.6045	6.5	5.6	3.6

$\alpha = 50\%$, $\gamma = 8\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.6980	6.5	4.0	2.6
0.400	4.0	0.0161	5.500	0.6980	6.5	4.3	2.7

$\alpha = 50\%$, $\gamma = 9\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.7935	6.5	4.5	2.7
0.400	4.0	0.0218	5.500	0.7935	6.5	5.0	3.1

$\alpha = 50\%$, $\gamma = 10\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.8915	6.5	5.2	3.1

Table B-2 The height of continuous phase in microemulsion type I

% Weight of aerosol OT	The volume of continuous phase in microemulsion (ml.)			
	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	3.3	3.5	4.1	4.8
7	3.5	3.9	5.0	5.6
8	4.0	4.3	-	-
9	4.5	5	-	-
10	5.2	-	-	-

Table B-3 The total amount of aerosol OT in microemulsion phase

% Weight of aerosol OT	The total amount of aerosol OT in continuous phase (mmole)			
	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	0.667	0.606	0.650	0.697
7	0.765	0.759	0.784	0.852
8	0.896	0.836	-	-
9	1.033	0.942	-	-
10	1.112	-	-	-

Table B-4 The total amount of n-decane solubilized in microemulsion phase

% Weight of aerosol OT	The total amount of n-decane solubilized in continuous phase (mmole)			
	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	1.121	2.973	7.076	11.871
7	1.419	3.708	8.716	13.151
8	2.434	4.251	-	-
9	4.595	6.395	-	-
10	7.192	-	-	-

Table B-5 Adsorption and adsolubilization without excess oil phase

%γ	%ε	Volume of continuous phase used in adsorption (ml.)	Aerosol OT				n-decane		
			[Aerosol OT] mM	Al ₂ O ₃ (g)	Adsorption (mmol/ g of Al ₂ O ₃)	%Adsorption	[n-decane] mM	Adsolubilization (mmol/ g of Al ₂ O ₃)	%Adsolubilization
6	0.3	1	187.74	0.0052	2.75	7.08	314.10	4.94	7.57
	0.4	1	159.52	0.0050	2.71	7.82	659.47	35.41	21.17
	0.5	1	148.19	0.0050	2.06	6.51	1531.87	38.78	11.24
	0.541	1	140.54	0.0054	0.85	3.15	1275.08	221.86	48.44
7	0.3	1	193.04	0.0052	4.93	11.71	337.18	13.15	16.87
	0.4	1	179.08	0.0053	2.95	8.03	752.18	37.47	20.89
	0.5	1	150.59	0.0051	1.23	4.00	1494.62	48.72	14.26
	0.541	1	151.44	0.0054	0.12	0.42	1315.39	191.31	43.99
8	0.3	1	195.74	0.0054	5.22	12.58	362.03	45.65	40.51
	0.4	1	170.28	0.0051	4.74	12.44	737.87	49.18	25.37
9	0.3	1	192.62	0.0052	7.12	16.12	626.59	75.87	38.64
	0.4	1	157.99	0.0053	5.72	16.11	950.66	61.96	25.67
10	0.3	1	206.55	0.0050	1.45	3.39	829.87	110.63	39.99

Table B-6 Adsorption and adsolubilization with excess oil phase

%γ	%ε	Volume of continuous phase used in adsorption (ml.)	Aerosol OT				n-decane		
			[Aerosol OT] mM	Al ₂ O ₃ (g)	Adsorption (mmol/ g of Al ₂ O ₃)	%Adsorption	[n-decane] mM	Adsolubilization (mmol/ g of Al ₂ O ₃)	%Adsolubilization
6	0.3	2.4	192.02	0.0121	1.99	4.95	676.27	-66.74	-99.01
	0.4	2.5	167.80	0.0126	1.04	3.04	1088.19	-49.93	-30.08
	0.5	2.7	156.41	0.0138	0.41	1.33	1360.61	71.45	21.16
	0.541	3.2	143.47	0.0161	0.33	1.13	1569.06	179.69	36.56
7	0.3	2.5	202.60	0.0126	3.19	7.34	538.06	-26.29	-32.68
	0.4	2.6	184.63	0.0132	1.98	5.18	993.25	-8.37	-4.47
	0.5	3.3	153.88	0.0165	0.60	1.90	1264.44	95.74	27.46
	0.541	3.6	151.56	0.0184	0.10	0.35	1245.38	215.82	46.97
8	0.3	2.6	202.50	0.0132	4.22	9.56	800.96	-37.90	-31.62
	0.4	2.7	178.27	0.0137	3.19	8.33	1036.56	-9.43	-4.84
9	0.3	2.7	196.59	0.0136	6.56	14.39	862.85	31.42	1550
	0.4	3.1	179.24	0.0155	1.82	4.82	977.28	60.35	23.59
10	0.3	3.1	207.19	0.0156	1.31	3.09	1250.35	26.37	9.59

APPENDIX C

Second preparation of microemulsion type I

Table C-1 Water/aerosol OT/n-decane microemulsion phase behavior at 45°C for adsorption and adsolubilization experiment

$\alpha = 50\%$, $\gamma = 6\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.5121	6.5	3.3	2.4
0.400	4.0	0.0161	5.500	0.5121	6.5	3.6	2.5
0.500	4.0	0.0201	5.500	0.5121	6.5	4.3	2.7
0.541	4.0	0.0218	5.500	0.5121	6.5	4.8	3.2

$\alpha = 50\%$, $\gamma = 7\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.300	4.0	0.0121	5.500	0.6045	6.5	3.5	2.5
0.400	4.0	0.0161	5.500	0.6045	6.5	4.0	2.6
0.500	4.0	0.0201	5.500	0.6045	6.5	5.0	3.3
0.541	4.0	0.0218	5.500	0.6045	6.5	5.5	3.6

$\alpha = 50\%$, $\gamma = 8\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.200	4.0	0.0080	5.500	0.6980	6.5	3.4	2.5
0.300	4.0	0.0121	5.500	0.6980	6.5	3.6	2.6
0.400	4.0	0.0161	5.500	0.6980	6.5	4.3	2.7

$\alpha = 50\%$, $\gamma = 9\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.2	4.0	0.0080	5.500	0.7935	6.5	4.0	2.5
0.300	4.0	0.0121	5.500	0.7935	6.5	4.2	2.7
0.400	4.0	0.0218	5.500	0.7935	6.5	5.0	3.0

$\alpha = 50\%$, $\gamma = 10\%$

% ϵ	Water (ml.)	NaCl (g)	n-decane (ml.)	Aerosol OT (g)	Total solution volume (ml.)	Volume of microemulsion phase in tube 1 (ml.)	Volume of microemulsion phase in tube 2 (ml.)
0.200	4.0	0.0080	5.500	0.8915	6.5	4.6	3.0
0.300	4.0	0.0121	5.500	0.8915	6.5	5.2	3.1

Table C-2 The height of continuous phase in microemulsion type I

% Weight of aerosol OT	The volume of continuous phase in microemulsion (ml.)				
	0.2 % wt. of NaCl	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	-	3.3	3.6	4.3	4.8
7	-	3.5	4.0	5.0	5.5
8	3.4	3.6	4.3	-	-
9	4.0	4.2	5.0	-	-
10	4.6	5.2	-	-	-

Table C-3 The total amount of aerosol OT in microemulsion phase

% Weight of aerosol OT	The total amount of aerosol OT in microemulsion phase (mmole)				
	0.2 % wt. of NaCl	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	-	0.668	0.640	0.697	0.702
7	-	0.758	0.788	0.795	0.803
8	0.841	0.799	0.777	-	-
9	0.973	0.907	0.890	-	-
10	1.11	1.17	-	-	-

Table C-4 The total amount of n-decane solubilized in microemulsion phase

%Weight of aerosol OT	The total amount of n-decane solubilized in microemulsion phase (mmole)				
	0.2 % wt. of NaCl	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	-	0.652	1.335	3.445	4.732
7	-	1.061	2.012	4.010	5.369
8	0.797	1.218	2.558	-	-
9	1.300	2.172	3.836	-	-
10	2.410	4.447	-	-	-

Table C-5 The amount of aerosol OT diffusion from excess oil phase

% Weight of aerosol OT	The amount of aerosol OT diffusion (mmole)				
	0.2 % wt. of NaCl	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	-	0.0171	0.0136	0.0103	0.0095
7	-	0.0191	0.0094	0.0071	0.0048
8	0.0025	0.0027	0.0107	-	-
9	0.0059	0.0061	0.0158	-	-
10	0.0149	0.0057	-	-	-

Table C-6 The amount of n-decane diffusion from excess oil phase

% Weight of aerosol OT	The amount of n-decane diffusion (mmole)				
	0.2 % wt. of NaCl	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	-	0.0440	0.1616	0	0.0439
7	-	0.0773	0.0689	0.1540	0.1131
8	0.0578	0.1058	0	-	-
9	0.1500	0.1261	0.0396	-	-
10	0.1009	0.0537	-	-	-

Table C-7 Volume of microemulsion phase and alumina after excess oil phase separation

%Weight of aerosol OT	Volume of microemulsion phase and alumina (ml.)				
	0.2 % wt. of NaCl	0.3 % wt. of NaCl	0.4 % wt. of NaCl	0.5 % wt. of NaCl	0.541 % wt. of NaCl
6	-	0.3	0.4	0.4	0.3
7	-	0.3	0.3	0.4	0.4
8	0.3	0.4	0.4	-	-
9	0.3	0.3	0.3	-	-
10	0.3	0.3	-	-	-

Table C-8 Adsorption and adsolubilization without excess oil phase

%γ	%ε	Volume of continuous phase used in adsorption (ml.)	Aerosol OT				n-decane		
			[Aerosol OT] mM	Al ₂ O ₃ (g)	Adsorption (mmol/ g of Al ₂ O ₃)	%Adsorption	[n-decane] mM	Adsolubilization (mmol/ g of Al ₂ O ₃)	%Adsolubilization
6	0.3	1	179.12	0.0052	4.48	11.51	160.38	7.16	18.84
	0.4	1	160.22	0.0051	3.42	9.82	251.55	23.40	32.18
	0.5	1	149.31	0.0053	2.42	7.91	621.13	33.92	22.44
	0.541	1	136.07	0.0052	1.97	7.00	631.42	68.16	35.95
7	0.3	1	186.48	0.0051	5.88	13.85	243.37	11.71	19.70
	0.4	1	179.12	0.0055	3.25	9.07	438.94	11.65	12.74
	0.5	1	146.02	0.0054	2.39	8.11	615.85	34.47	23.21
	0.541	1	141.35	0.0050	0.93	3.21	664.59	62.33	31.92
8	0.2	1	213.67	0.0053	5.14	11.34	133.93	17.70	41.18
	0.3	1	196.80	0.0050	5.02	11.30	227.71	22.10	32.67
	0.4	1	163.13	0.0051	3.43	9.69	415.65	36.51	30.94
9	0.2	1	206.04	0.0055	5.67	13.14	214.90	18.60	32.25
	0.3	1	192.65	0.0051	4.58	10.81	312.36	40.12	39.58
	0.4	1	160.75	0.0053	3.27	9.73	432.88	63.09	43.58
10	0.2	1	203.93	0.0049	7.46	15.20	311.24	43.30	40.51
	0.3	1	208.62	0.0050	3.12	6.95	566.95	57.67	33.71

Table C-9 Adsorption and adsolubilization with excess oil phase

%γ	%ε	Aerosol OT					n-decane			
		[Aerosol OT] without Al ₂ O ₃ mM	[Aerosol OT] with Al ₂ O ₃ mM	Al ₂ O ₃ (g)	Adsorption (mmol/ g of Al ₂ O ₃)	%Adsorption	[n-decane] without Al ₂ O ₃ mM	[n-decane] with Al ₂ O ₃ mM	Adsolubilization (mmol/ g of Al ₂ O ₃)	%Adsolubilization
6	0.3	196.24	266.57	0.0050	4.22	26.38	204.42	339.47	8.10	39.78
	0.4	173.81	188.96	0.0050	1.21	8.01	413.21	542.41	10.34	23.81
	0.5	159.49	176.71	0.0055	1.24	9.65	617.88	788.44	12.40	21.63
	0.541	145.65	164.28	0.0054	1.03	11.33	675.34	1433.43	42.11	52.88
7	0.3	205.59	315.29	0.0053	6.21	34.79	320.72	491.50	9.67	34.75
	0.4	188.57	242.06	0.0053	3.03	22.10	507.88	748.34	13.61	32.13
	0.5	153.08	199.88	0.0051	3.67	23.41	769.89	1103.69	26.18	30.24
	0.541	146.14	158.97	0.0050	1.03	8.07	777.77	1348.89	45.69	42.34
8	0.2	215.65	352.07	0.0055	7.44	38.75	191.83	363.26	9.35	47.19
	0.3	199.59	254.20	0.0054	4.04	21.48	333.59	481.40	10.95	30.70
	0.4	173.83	201.04	0.0051	2.13	13.53	408.64	685.75	21.73	40.41
9	0.2	212.01	317.72	0.0051	6.22	33.27	364.90	730.27	21.49	50.03
	0.3	198.78	277.28	0.0055	4.28	28.31	438.54	961.31	28.51	54.38
	0.4	176.64	223.74	0.0052	2.71	21.05	472.48	1374.21	52.02	65.62
10	0.2	218.90	294.70	0.0050	4.54	25.71	411.23	1153.01	44.50	64.33
	0.3	214.37	265.13	0.0053	2.87	19.15	620.65	1374.32	42.66	54.84

APPENDIX D

Example of % adsorption and % adsolubilization calculation

for $\gamma = 6\%$, $\alpha = 50\%$, $\varepsilon = 0.3\%$

First preparation of microemulsion type I

The calibration curve for aerosol OT concentration. The relation between the aerosol OT concentration and peak area from HPLC is

$$Y_{AOT} = 101184 X_{AOT} + 2.5785 \quad \text{-----(1)}$$

where X_{AOT} = concentration of aerosol OT (Molar, M)

Y_{AOT} = peak area of aerosol OT from HPLC (μs)

The calibration curve for n-decane concentration. The relation between the n-decane concentration and peak area from GC is

$$Y_{\text{decane}} = 10^8 X_{\text{decane}} + 104949 \quad \text{-----(2)}$$

where X_{decane} = concentration of decane (Molar, M)

Y_{decane} = peak area of n-decane from GC (μVs)

Part I : % adsorption of aerosol OT

Before adsorption, the aerosol OT average peak area of diluted microemulsion from HPLC is 207.009 μs and the 0.5 ml. microemulsion is diluted 100 times.

substitute into (1)

The concentration of aerosol OT is 0.2020 M.

1 ml. of microemulsion have aerosol OT 0.2020 mM.

After adsorption without excess n-decane phase , the aerosol OT average peak area of diluted microemulsion from HPLC is 192.544 μs and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (1)

The concentration of aerosol OT is 0.1877 M.

1 ml. of microemulsion have aerosol OT 0.1877 mM.

The amount of alumina is used for adsorption experiment is 0.0052 g contact with 1 ml. of microemulsion.

The total amount of aerosol OT adsorption on alumina per gram of alumina = $(0.2020 - 0.1877) / 0.0052 = 2.75$ mM/g of alumina.

$$\begin{aligned} \text{Percent of aerosol OT adsorption} &= (0.2020 - 0.1877) / 0.2020 \times 100 \\ &= 7.08 \% \end{aligned}$$

After adsorption with excess n-decane phase, the aerosol OT average peak area of diluted microemulsion from HPLC is 196.880 μ s and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (1)

The concentration of aerosol OT is 0.1920 M.

2.4 ml. of microemulsion contact with alumina have aerosol OT 0.4848 mM.

The amount of alumina is used for adsorption experiment is 0.0121 g contact with 2.4 ml. of microemulsion.

The total amount of aerosol OT adsorption on alumina per gram of alumina = $(2.4 \times (0.2020 - 0.1920)) / 0.0121 = 1.99$ mM/g of alumina.

$$\begin{aligned} \text{Percent of aerosol OT adsorption} &= (0.2020 - 0.1920) / 0.2020 \times 100 \\ &= 4.95 \% \end{aligned}$$

Part II : % adsolubilization of n-decane

Before adsolubilization, the n-decane average peak area of diluted microemulsion from GC is 234864.30 μ Vs and the 0.5 ml. microemulsion is diluted 100 times.

substitute into (2)

The concentration of n-decane is 0.3398 M.

1 ml. of microemulsion have aerosol OT 0.3398 mM.

After adsolubilization without excess n-decane phase, the n-decane average peak area of diluted microemulsion from GC is 209151.20 μ Vs and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (2)

The concentration of n-decane is 0.3141 M.

1 ml. of microemulsion have aerosol OT 0.3141 mM.

The amount of alumina is used for adsorption experiment is 0.0052 g contact with 1 ml. of microemulsion.

The total amount of n-decane adsolubilization on alumina per gram of alumina = $(0.3398 - 0.3141) / 0.0052 = 4.94$ mM/g of alumina.

$$\begin{aligned} \text{Percent of n-decane adsolubilization} &= (0.3398 - 0.3141) / 0.3398 \times 100 \\ &= 7.57 \% \end{aligned}$$

After adsolubilization with excess n-decane phase, the n-decane average peak area of diluted microemulsion from GC is 571320.73 μ Vs and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (2)

The concentration of n-decane is 0.6762 M.

2.4 ml. of microemulsion contact with alumina have n-decane 0.8155 mM.

The amount of alumina is used for adsorption experiment is 0.0121 g contact with 2.4 ml. of microemulsion.

The total amount of aerosol OT adsorption on alumina per gram of alumina = $(2.4 \times (0.3398 - 0.6762)) / 0.0121 = -66.74$ mM/g of alumina.

Percent of n-decane adsolubilization = $(0.3398 - 0.6762) / 0.3398 \times 100$
= -99.01 %

Second preparation of microemulsion type I

The calibration curve for aerosol OT concentration. The relation between the aerosol OT concentration and peak area from HPLC is

$$Y_{AOT} = 101184 X_{AOT} + 2.5785 \quad \text{-----}(3)$$

where X_{AOT} = concentration of aerosol OT (Molar, M)

Y_{AOT} = peak area of aerosol OT from HPLC (μ s)

The calibration curve for n-decane concentration. The relation between the n-decane concentration and peak area from GC is

$$Y_{decane} = 2 \times 10^8 X_{decane} + 83700 \quad \text{-----}(4)$$

where X_{decane} = concentration of decane (Molar, M)

Y_{decane} = peak area of n-decane from GC (μ Vs)

Part I : % adsorption of aerosol OT

Before adsorption, the aerosol OT average peak area of diluted microemulsion from HPLC is 207.398 μ s and the 1 ml. microemulsion is diluted 100 times.

substitute into (3)

The concentration of aerosol OT is 0.2024 M.

1 ml. of microemulsion have aerosol OT 0.2024 mM.

After adsorption without excess n-decane phase , the aerosol OT average peak area of diluted microemulsion from HPLC is 183.82 μ s and the 1 ml. of microemulsion is diluted 100 times.

substitute into (3)

The concentration of aerosol OT is 0.1791 M.

1 ml. of microemulsion have aerosol OT 0.1791 mM.

The amount of alumina is used for adsorption experiment is 0.0052 g contact with 1 ml. of microemulsion.

The total amount of aerosol OT adsorption on alumina per gram of alumina = $(0.2024-0.1791)/0.0052 = 4.48 \text{ mM/g}$ of alumina.

Percent of aerosol OT adsorption = $(0.2024-0.1791)/0.2024 \times 100$
 $= 11.51 \%$

After adsorption with excess n-decane phase, the aerosol OT average peak area of diluted microemulsion from HPLC is 201.14 μs and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (3)

The concentration of aerosol OT is 0.1962 M.

The amount of alumina is used for adsorption experiment is 0.0050 g contact with 1 ml. of microemulsion.

The 0.3 ml. of microemulsion and alumina is diluted to make 50 ml of solution and the volume of alumina was neglected. The aerosol OT average peak area of diluted microemulsion and alumina from HPLC is 164.416 μs .

substitute into (3)

The concentration of aerosol OT is 0.2665 M.

0.3 ml. of microemulsion and alumina have aerosol OT 0.0799 mM.

The total amount of aerosol OT adsorption on alumina per gram of alumina = $(0.3 \times (0.2665-0.1962))/0.0050 = 4.22 \text{ mM/g}$ of alumina.

Percent of aerosol OT adsorption = $(0.2665-0.1962)/0.2665 \times 100$
 $= 26.38 \%$

Part II : % adsolubilization of n-decane

Before adsolubilization, the n-decane average peak area of diluted microemulsion from GC is 311527.50 μ Vs and the 0.5 ml. microemulsion is diluted 100 times.

substitute into (4)

The concentration of n-decane is 0.1976 M.

After adsolubilization without excess n-decane phase, the n-decane average peak area of diluted microemulsion from GC is 237064.38 μ Vs and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (4)

The concentration of n-decane is 0.1603 M.

1 ml. of microemulsion have aerosol OT 0.1603 mM.

The amount of alumina is used for adsorption experiment is 0.0052 g contact with 1 ml. of microemulsion

The total amount of n-decane adsolubilization on alumina per gram of alumina = $(0.1976 - 0.1603) / 0.0052 = 7.16$ mM/g of alumina.

$$\begin{aligned} \text{Percent of n-decane adsolubilization} &= (0.1976 - 0.1603) / 0.1976 \times 100 \\ &= 18.84 \% \end{aligned}$$

After adsolubilization with excess n-decane phase, the n-decane average peak area of diluted microemulsion from GC is 325147.21 μ Vs and the 0.5 ml. of microemulsion is diluted 100 times.

substitute into (4)

The concentration of n-decane is 0.2044 M.

The amount of alumina is used for adsorbilization experiment is 0.0050 g contact with 1 ml. of microemulsion.

The 0.3 ml. of microemulsion and alumina is diluted to make 50 ml of solution and the volume of alumina was neglected. The n-decane average peak area of diluted microemulsion and alumina from GC is 323683.97 μ Vs.

substitute into (4)

The concentration of n-decane is 0.3394 M.

0.3 ml. of microemulsion and alumina have aerosol OT 0.01018 mM.

The total amount of aerosol OT adsorption on alumina per gram of alumina = $(0.3 \times (0.3394 - 0.2044)) / 0.0050 = 8.10$ mM/g of alumina.

$$\begin{aligned} \text{Percent of aerosol OT adsorption} &= (0.3394 - 0.2044) / 0.3394 \times 100 \\ &= 39.78 \% \end{aligned}$$

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