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APPENDIX

Table A-1 Adsorption Isotherm of CTAB

Initial(μM)	Initial(ppm)	Equilibrium		Adsorbed		ad(μmol/g silica)
		ppm carbon	eq(μM)	ad(μM)	ad(μmol)	
35000	12756.10	4794.50	17568.71	17431.29	348.63	697.25
32500	11844.95	4116.50	15084.28	17415.72	348.31	696.63
30000	10933.80	3504.50	12841.70	17158.30	343.17	686.33
27500	10022.65	2705.00	9912.06	17587.94	351.76	703.52
24000	8747.04	1579.50	5787.83	18212.17	364.24	728.49
23000	8382.58	1261.00	4620.74	18379.26	367.59	735.17
22500	8200.35	1255.50	4600.59	17899.41	357.99	715.98
22000	8018.12	1101.50	4036.28	17963.72	359.27	718.55
21000	7653.66	820.45	3006.41	17993.59	359.87	719.74
20000	7289.20	553.10	2026.75	17973.25	359.47	718.93
19500	7106.97	462.95	1696.41	17803.59	356.07	712.14
19000	6924.74	388.05	1421.95	17578.05	351.56	703.12
18800	6851.85	299.45	1097.29	17702.71	354.05	708.11
18600	6778.96	184.70	676.80	17923.20	358.46	716.93
18200	6633.17	189.40	694.03	17505.97	350.12	700.24
17500	6378.05	95.48	349.87	17150.13	343.00	686.01
17000	6195.82	54.93	201.28	16798.72	335.97	671.95
16000	5831.36	37.18	136.24	15863.76	317.28	634.55
15000	5466.90	35.92	131.62	14868.38	297.37	594.74
12500	4555.75	30.67	112.39	12387.61	247.75	495.50
10000	3644.60	29.06	106.49	9893.51	197.87	395.74
8500	3097.91	27.74	101.65	8398.35	167.97	335.93
7000	2551.22	25.68	94.08	6905.92	138.12	276.24
6500	2368.99	24.88	91.17	6408.83	128.18	256.35
6000	2186.76	21.46	78.64	5921.36	118.43	236.85
5500	2004.53	19.47	71.33	5428.67	108.57	217.15
5000	1822.30	17.03	62.40	4937.60	98.75	197.50
4500	1640.07	17.76	65.06	4434.94	88.70	177.40
2400	874.70	16.89	61.89	2338.11	46.76	93.52
1500	546.69	16.54	60.61	1439.39	28.79	57.58
900	328.01	15.47	56.69	843.31	16.87	33.73
700	255.12	14.05	51.48	648.52	12.97	25.94
300	109.34	12.08	44.27	255.73	5.11	10.23

Table A-2 Adsorption Isotherm of Triton X-100

Initial(μM)	Initial(ppm)	Equilibrium		Adsorbed		ad(μmol/g silica)
		ppm carbon	eq(μM)	ad(μM)	ad(μmol)	
10100	6312.50	600.95	1251.72	8848.28	176.97	353.93
10000	6250.00	683.70	1424.08	8575.92	171.52	343.04
9800	6125.00	599.85	1249.43	8550.57	171.01	342.02
9600	6000.00	531.60	1107.27	8492.73	169.85	339.71
9400	5875.00	441.60	919.81	8480.19	169.60	339.21
9200	5750.00	426.55	888.46	8311.54	166.23	332.46
9150	5718.75	269.05	560.40	8589.60	171.79	343.58
9050	5656.25	200.15	416.89	8633.11	172.66	345.32
9000	5625.00	212.55	442.72	8557.28	171.15	342.29
8500	5312.50	246.25	512.91	7987.09	159.74	319.48
8250	5156.25	140.00	291.61	7958.39	159.17	318.34
8000	5000.00	164.35	342.32	7657.68	153.15	306.31
7000	4375.00	148.20	308.69	6691.31	133.83	267.65
6000	3750.00	133.25	277.55	5722.45	114.45	228.90
5000	3125.00	116.85	243.39	4756.61	95.13	190.26
4000	2500.00	99.98	208.24	3791.76	75.84	151.67
3000	1875.00	102.82	214.16	2785.84	55.72	111.43
2000	1250.00	86.39	179.94	1820.06	36.40	72.80
1500	937.50	84.06	175.09	1324.91	26.50	53.00
1000	625.00	74.85	155.89	844.11	16.88	33.76
900	562.50	71.22	148.34	751.66	15.03	30.07
800	500.00	67.88	141.38	658.62	13.17	26.34
700	437.50	66.55	138.61	561.39	11.23	22.46
600	375.00	62.25	129.65	470.35	9.41	18.81
500	312.50	57.90	120.59	379.41	7.59	15.18
400	250.00	54.14	112.76	287.24	5.74	11.49
300	187.50	42.77	89.09	210.91	4.22	8.44
200	125.00	37.88	78.89	121.11	2.42	4.84
170	106.25	33.14	69.02	100.98	2.02	4.04
130	81.25	26.75	55.72	74.28	1.49	2.97
100	62.50	23.85	49.67	50.33	1.01	2.01
50	31.25	18.62	38.78	11.22	0.22	0.45

Table A-3 Adsorption Isotherm of CTAB/Triton X-100 ratio 1:1

Initial(μM)	Total			Triton			CTAB	
	Equilibrium		ad(μmol/g silica)	Equilibrium		ad(μmol/g silica)	Equilibrium eq(μM)	ad(μmol/g silica)
	ppm carbon	eq(μM)		Absorbance	eq(μM)			
18000	2207.50	5902.41	483.90	4.8995	3768.85	209.25	1549.06	298.04
16000	1465.50	3918.45	483.26	3.1459	2419.90	223.20	1169.22	273.23
14000	760.40	2033.16	478.67	1.7646	1357.40	225.70	432.11	262.72
13500	774.30	2070.32	457.19	1.7936	1379.71	214.81	444.30	252.23
13000	460.05	1230.08	470.80	1.0876	836.62	226.54	235.07	250.60
12500	260.65	696.93	472.12	0.6161	473.92	231.04	133.31	244.67
12000	119.25	318.85	467.25	0.2368	182.15	232.71	120.45	235.18
8500	75.01	200.56	331.98	0.1245	95.73	166.17	108.08	165.68
6500	50.70	135.56	254.58	0.0910	70.00	127.20	63.98	127.44
4000	35.36	94.55	156.22	0.0691	53.12	77.88	37.25	78.51
3000	27.13	72.53	117.10	0.0550	42.31	58.31	25.90	58.96
2000	21.87	58.48	77.66	0.0469	36.08	38.56	17.51	39.30
1500	20.80	55.60	57.78	0.0460	35.38	28.58	14.80	29.41
1000	18.84	50.37	37.99	0.0431	33.12	18.68	11.59	19.54
500	16.59	44.34	18.23	0.0372	28.58	8.86	11.19	9.55
300	15.10	40.37	10.39	0.0339	26.06	4.96	10.12	5.60

Table A-4 Adsorption Isotherm of CTAB/Triton X-100 ratio 3:1

Initial(μM)	Total			Triton			CTAB	
	Equilibrium		ad(μmol/g silica)	Equilibrium		ad(μmol/g silica)	Equilibrium eq(μM)	ad(μmol/g silica)
	ppm carbon	eq(μM)		Absorbance	eq(μM)			
20000	1924.50	5715.77	571.37	2.8233	1882.17	124.71	3509.61	459.62
18000	1328.50	3945.65	562.17	1.7525	1168.33	133.27	2647.27	434.11
16000	743.30	2207.60	551.70	1.0499	699.92	132.00	1401.88	423.92
14000	383.55	1139.14	514.43	0.5591	372.70	125.09	703.60	391.86
12000	163.77	486.38	460.54	0.2661	177.42	112.90	269.06	349.24
11750	118.65	352.39	455.90	0.1334	88.90	113.94	262.92	341.98
11500	52.25	155.18	453.79	0.0626	41.75	113.33	111.32	340.55
11000	44.48	132.11	434.72	0.0534	35.60	108.58	94.67	326.21
10500	29.69	88.18	416.47	0.0437	29.13	103.83	53.98	312.84
10000	40.59	120.55	395.18	0.0526	35.03	98.60	82.02	296.72
7500	22.47	66.74	297.33	0.0297	19.82	74.21	44.68	223.21
5000	15.47	45.95	198.16	0.0243	16.22	49.35	26.35	148.95
2500	11.42	33.90	98.64	0.0220	14.63	24.41	14.87	74.41
1000	8.03	23.84	39.05	0.0140	9.30	9.63	12.15	29.51
800	7.47	22.19	31.11	0.0127	8.43	7.66	11.70	23.53
600	7.05	20.93	23.16	0.0128	8.53	5.66	10.04	17.60
400	6.67	19.82	15.21	0.0123	8.22	3.67	9.28	11.63

Table A-5 Adsorption Isotherm of CTAB/Triton X-100 ratio 1:3

Initial(μM)	Total			Triton			CTAB	
	Equilibrium		ad(μmol/g silica)	Equilibrium		ad(μmol/g silica)	Equilibrium eq(μM)	ad(μmol/g silica)
	ppm carbon	eq(μM)		Absorbance	eq(μM)			
23000	5344.00	12451.07	421.96	15.6283	10418.83	273.25	1259.80	179.61
22000	4585.50	10683.83	452.65	13.5858	9057.17	297.71	880.13	184.79
21000	3987.50	9290.54	468.38	11.8345	7889.67	314.41	741.94	180.32
20000	3469.00	8082.48	476.70	10.3645	6909.67	323.61	566.74	177.33
18000	2677.50	6238.35	470.47	8.0580	5372.00	325.12	370.78	165.17
16000	1976.00	4603.91	455.84	5.9123	3941.50	322.34	313.16	147.47
14000	1278.00	2977.63	440.89	3.7633	2508.83	319.65	271.78	129.13
12000	673.55	1569.32	417.23	1.9225	1281.67	308.73	212.82	111.49
11500	397.80	926.84	422.93	1.0748	716.50	316.34	195.06	107.20
11000	291.20	678.47	412.86	0.7455	497.00	310.12	189.95	102.40
10500	216.40	504.19	399.83	0.5205	347.00	301.12	179.46	97.82
10000	164.90	384.20	384.63	0.3712	247.48	290.10	165.79	93.37
7500	106.80	248.84	290.05	0.2158	143.83	219.25	135.59	69.58
5000	92.41	215.30	191.39	0.1881	125.42	144.98	115.65	45.37
2500	63.98	149.06	94.04	0.1395	92.98	71.28	69.52	22.22
1000	48.17	112.23	35.51	0.1158	77.17	26.91	40.07	8.40
600	38.66	90.07	20.40	0.0910	60.63	15.57	34.39	4.62
400	28.41	66.1929	13.35	0.0615	40.98	10.36	31.40	2.74

Table A-6 Adsolubilization of Toluene of CTAB
Weight of silica = 14.75 g
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Density of toluene = 0.867 g/ml
Adsorption = 700 μmol/g silica

									Supernatant			
[Tol] initial (μliter)	[Tol] initial (g/l)	[Tol] initial (mol/l)	Area at equilibrium	[Tol] eq (mol/l)	[Tol] ads (mol/l)	[Tol] ads (μmol/l)	[Tol] ads (μmol/g silica)	X admicelle	Mol of Tol	Mol of H_2O	X bulk	K
50	7.35E-02	7.99E-04	1.74E+05	3.49E-04	4.50E-04	4.50E+02	1.80E+01	2.51E-02	2.06E-04	3.28E+01	6.28E-06	3.99E+03
100	1.47E-01	1.60E-03	3.49E+05	6.97E-04	9.00E-04	9.00E+02	3.60E+01	4.89E-02	4.11E-04	3.28E+01	1.25E-05	3.90E+03
200	2.94E-01	3.19E-03	6.91E+05	1.38E-03	1.81E-03	1.81E+03	7.25E+01	9.39E-02	8.15E-04	3.28E+01	2.49E-05	3.77E+03
300	4.41E-01	4.79E-03	9.74E+05	1.95E-03	2.84E-03	2.84E+03	1.14E+02	1.40E-01	1.15E-03	3.28E+01	3.51E-05	3.98E+03
350	5.14E-01	5.59E-03	1.14E+06	2.29E-03	3.30E-03	3.30E+03	1.32E+02	1.59E-01	1.35E-03	3.28E+01	4.12E-05	3.85E+03

Table A-7 Adsolubilization of Toluene of Triton
Weight of silica = 14.75 g
Molecular weight of toluene = 92 g/mol
Equation from GCY= 5E+08X
Where Y = area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Density of toluene = 0.867 g/ml
Adsorption = 229 μmol/g silica

									Supernatant			
[Tol] initial (μliter)	[Tol] initial (g/l)	[Tol] initial (mol/l)	Area at equilibrium	[Tol] eq (mol/l)	[Tol] ads (mol/l)	[Tol] ads (μmol/l)	[Tol] ads (μmol/g silica)	X admicelle	Mol of Tol	Mol of H_2O	X bulk	K
50	7.35E-02	7.99E-04	2.90E+05	5.81E-04	2.18E-04	2.18E+02	8.71E+00	3.67E-02	3.43E-04	3.28E+01	1.05E-05	3.51E+03
100	1.47E-01	1.60E-03	5.74E+05	1.15E-03	4.49E-04	4.49E+02	1.79E+01	7.27E-02	6.78E-04	3.28E+01	2.07E-05	3.52E+03
200	2.94E-01	3.19E-03	1.14E+06	2.28E-03	9.14E-04	9.14E+02	3.66E+01	1.38E-01	1.35E-03	3.28E+01	4.11E-05	3.35E+03
300	4.41E-01	4.79E-03	1.66E+06	3.31E-03	1.48E-03	1.48E+03	5.92E+01	2.06E-01	1.95E-03	3.28E+01	5.96E-05	3.45E+03
350	5.14E-01	5.59E-03	1.86E+06	3.72E-03	1.87E-03	1.87E+03	7.49E+01	2.47E-01	2.19E-03	3.28E+01	6.69E-05	3.68E+03

Table A-8 Adsolubilization of Toluene of CTAB/Triton ratio 1:1
Weight of silica = 14.75 g
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Density of toluene = 0.867 g/ml
Adsorption = 332 μmol/g silica

									Supernatant			
[Tol] initial (μliter)	[Tol] initial (g/l)	[Tol] initial (mol/l)	Area at equilibrium	[Tol] eq (mol/l)	[Tol] ads (mol/l)	[Tol] ads (μmol/l)	[Tol] ads (μmol/g silica)	X admicelle	Mol of Tol	Mol of H_2O	X bulk	K
50	7.35E-02	7.99E-04	2.59E+05	5.18E-04	2.81E-04	2.81E+02	1.12E+01	3.27E-02	3.06E-04	3.28E+01	9.33E-06	3.51E+03
100	1.47E-01	1.60E-03	5.25E+05	1.05E-03	5.47E-04	5.47E+02	2.19E+01	6.18E-02	6.20E-04	3.28E+01	1.89E-05	3.27E+03
200	2.94E-01	3.19E-03	1.02E+06	2.05E-03	1.15E-03	1.15E+03	4.58E+01	1.21E-01	1.21E-03	3.28E+01	3.69E-05	3.29E+03
300	4.41E-01	4.79E-03	1.45E+06	2.91E-03	1.89E-03	1.89E+03	7.55E+01	1.85E-01	1.71E-03	3.28E+01	5.23E-05	3.54E+03
350	5.14E-01	5.59E-03	1.67E+06	3.35E-03	2.25E-03	2.25E+03	8.98E+01	2.13E-01	1.97E-03	3.28E+01	6.02E-05	3.54E+03

Table A-9 Adsolubilization of Toluene of CTAB/Triton ratio 3:1
Weight of silica = 14.75 g
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Density of toluene = 0.867 g/ml
Adsorption = 454 μmol/g silica

									Supernatant			
[Tol] initial (μliter)	[Tol] initial (g/l)	[Tol] initial (mol/l)	Area at equilibrium	[Tol] eq (mol/l)	[Tol] ads (mol/l)	[Tol] ads (μmol/l)	[Tol] ads (μmol/g silica)	X admicelle	mol of Tol	Mol of H_2O	X bulk	K
50	7.35E-02	7.99E-04	2.19E+05	4.38E-04	3.61E-04	3.61E+02	1.44E+01	3.08E-02	2.58E-04	3.28E+01	7.89E-06	3.90E+03
100	1.47E-01	1.60E-03	4.37E+05	8.73E-04	7.24E-04	7.24E+02	2.90E+01	6.00E-02	5.15E-04	3.28E+01	1.57E-05	3.81E+03
200	2.94E-01	3.19E-03	8.15E+05	1.63E-03	1.57E-03	1.57E+03	6.26E+01	1.21E-01	9.61E-04	3.28E+01	2.93E-05	4.13E+03
300	4.41E-01	4.79E-03	1.20E+06	2.39E-03	2.40E-03	2.40E+03	9.59E+01	1.74E-01	1.41E-03	3.28E+01	4.31E-05	4.05E+03
350	5.14E-01	5.59E-03	1.35E+06	2.70E-03	2.89E-03	2.89E+03	1.16E+02	2.03E-01	1.59E-03	3.28E+01	4.86E-05	4.18E+03

Table A-10 Adsolubilization of Toluene of CTAB/Triton ratio 1:3
Weight of silica = 14.75 g
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Density of toluene = 0.867 g/ml
Adsorption = 290 μmol/g silica

									Supernatant			
[Tol] initial (μliter)	[Tol] initial (g/l)	[Tol] initial (mol/l)	Area at equilibrium	[Tol] eq (mol/l)	[Tol] ads (mol/l)	[Tol] ads (μmol/l)	[Tol] ads (μmol/g silica)	X admicelle	Mol of Tol	Mol of H_2O	X bulk	K
50	7.35E-02	7.99E-04	2.72E+05	5.44E-04	2.55E-04	2.55E+02	1.02E+01	3.40E-02	3.21E-04	3.28E+01	9.79E-06	3.47E+03
100	1.47E-01	1.60E-03	5.32E+05	1.06E-03	5.34E-04	5.34E+02	2.14E+01	6.86E-02	6.27E-04	3.28E+01	1.91E-05	3.58E+03
200	2.94E-01	3.19E-03	1.03E+06	2.07E-03	1.13E-03	1.13E+03	4.52E+01	1.35E-01	1.22E-03	3.28E+01	3.72E-05	3.62E+03
300	4.41E-01	4.79E-03	1.46E+06	2.92E-03	1.88E-03	1.88E+03	7.50E+01	2.06E-01	1.72E-03	3.28E+01	5.25E-05	3.91E+03
350	5.14E-01	5.59E-03	1.70E+06	3.39E-03	2.20E-03	2.20E+03	8.79E+01	2.33E-01	2.00E-03	3.28E+01	6.11E-05	3.81E+03

Table A-11 Adsolubilization of Acetophenone of CTAB
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Equation from UV Y= 15924X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Adsorption = 700 μmol/g silica

									Supernatant			
[Ace] initial (μliter)	[Ace] initial (g/l)	[Ace] initial (mol/l)	Absorbance	[Ace] eq (mol/l)	[Ace] ads (mol/l)	[Ace] ads (μmol/l)	[Ace] ads (μmol/g silica)	X admicelle	Mol of Ace	Mol of H_2O	X bulk	K
100	1.74E-01	1.45E-03	1.11E+01	6.99E-04	7.52E-04	7.52E+02	3.01E+01	4.12E-02	4.12E-04	3.28E+01	1.26E-05	3.27E+03
500	8.70E-01	7.25E-03	8.10E+01	5.08E-03	2.17E-03	2.17E+03	8.67E+01	1.10E-01	3.00E-03	3.28E+01	9.16E-05	1.20E+03
1000	1.74E+00	1.45E-02	1.57E+02	9.87E-03	4.63E-03	4.63E+03	1.85E+02	2.09E-01	5.83E-03	3.27E+01	1.78E-04	1.18E+03
1500	2.61E+00	2.18E-02	2.27E+02	1.43E-02	7.49E-03	7.49E+03	3.00E+02	3.00E-01	8.42E-03	3.27E+01	2.57E-04	1.17E+03
2000	3.48E+00	2.90E-02	2.92E+02	1.83E-02	1.07E-02	1.07E+04	4.28E+02	3.79E-01	1.08E-02	3.27E+01	3.30E-04	1.15E+03

Table A-12 Adsolubilization of Acetophenone of Triton
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Equation from UV Y= 17595X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Adsorption = 229 μmol/g silica

									Supernatant			
[Ace] initial (μliter)	[Ace] initial (g/l)	[Ace] initial (mol/l)	Absorbance	[Ace] eq (mol/l)	[Ace] ads (mol/l)	[Ace] ads (μmol/l)	[Ace] ads (μmol/g silica)	X admicelle	Mol of Ace	Mol of H_2O	X bulk	K
100	1.74E-01	1.45E-03	1.93E+01	1.10E-03	3.53E-04	3.53E+02	1.41E+01	5.81E-02	6.48E-04	3.28E+01	1.98E-05	2.94E+03
500	8.70E-01	7.25E-03	9.66E+01	5.49E-03	1.76E-03	1.76E+03	7.06E+01	2.36E-01	3.24E-03	3.28E+01	9.88E-05	2.38E+03
1000	1.74E+00	1.45E-02	1.82E+02	1.03E-02	4.16E-03	4.16E+03	1.66E+02	4.21E-01	6.10E-03	3.27E+01	1.86E-04	2.26E+03
1500	2.61E+00	2.18E-02	2.61E+02	1.48E-02	6.93E-03	6.93E+03	2.77E+02	5.48E-01	8.75E-03	3.27E+01	2.67E-04	2.05E+03
2000	3.48E+00	2.90E-02	3.24E+02	1.84E-02	1.06E-02	1.06E+04	4.23E+02	6.49E-01	1.09E-02	3.27E+01	3.32E-04	1.95E+03

Table A-13 Adsolubilization of Acetophenone of CTAB/Triton ratio 1:1
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Equation from UV Y= 19372X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Adsorption = 332 μmol/g silica

									Supernatant			
[Ace] initial (μliter)	[Ace] initial (g/l)	[Ace] initial (mol/l)	Absorbance	[Ace] eq (mol/l)	[Ace] ads (mol/l)	[Ace] ads (μmol/l)	[Ace] ads (μmol/g silica)	X admicelle	Mol of Ace	Mol of H_2O	X bulk	K
100	1.74E-01	1.45E-03	1.78E+01	9.19E-04	5.32E-04	5.32E+02	2.13E+01	6.02E-02	5.42E-04	3.28E+01	1.65E-05	3.64E+03
500	8.70E-01	7.25E-03	8.63E+01	4.46E-03	2.80E-03	2.80E+03	1.12E+02	2.52E-01	2.63E-03	3.28E+01	8.02E-05	3.14E+03
1000	1.74E+00	1.45E-02	1.55E+02	8.00E-03	6.51E-03	6.51E+03	2.60E+02	4.40E-01	4.72E-03	3.27E+01	1.44E-04	3.05E+03
1500	2.61E+00	2.18E-02	2.35E+02	1.21E-02	9.65E-03	9.65E+03	3.86E+02	5.38E-01	7.14E-03	3.27E+01	2.18E-04	2.46E+03
2000	3.48E+00	2.90E-02	2.91E+02	1.50E-02	1.40E-02	1.40E+04	5.60E+02	6.28E-01	8.85E-03	3.27E+01	2.71E-04	2.32E+03

Adsolubilization of Acetophenone of CTAB/Triton ratio 3:1

Weight of silica = 14.75 g

Molecular weight of acetophenone = 120 g/mol

Equation from UV Y= 21282X

Where Y = absorbance from UV

X = Equilibrium concentration of acetophenone (mol/l)

Density of acetophenone = 1.027 g/ml

Adsorption = 454 μmol/g silica

									Supernatant			
[Ace] initial (μliter)	[Ace] initial (g/l)	[Ace] initial (mol/l)	Absorbance	[Ace] eq (mol/l)	[Ace] ads (mol/l)	[Ace] ads (μmol/l)	[Ace] ads (μmol/g silica)	X admicelle	Mol of Ace	Mol of H_2O	X bulk	K
100	1.74E-01	1.45E-03	1.75E+01	8.21E-04	6.29E-04	6.29E+02	2.52E+01	5.25E-02	4.85E-04	3.28E+01	1.48E-05	3.55E+03
500	8.70E-01	7.25E-03	8.77E+01	4.12E-03	3.13E-03	3.13E+03	1.25E+02	2.16E-01	2.43E-03	3.28E+01	7.42E-05	2.92E+03
1000	1.74E+00	1.45E-02	1.70E+02	7.98E-03	6.52E-03	6.52E+03	2.61E+02	3.65E-01	4.71E-03	3.27E+01	1.44E-04	2.54E+03
1500	2.61E+00	2.18E-02	2.46E+02	1.15E-02	1.02E-02	1.02E+04	4.09E+02	4.74E-01	6.81E-03	3.27E+01	2.08E-04	2.28E+03
2000	3.48E+00	2.90E-02	3.16E+02	1.48E-02	1.42E-02	1.42E+04	5.67E+02	5.55E-01	8.75E-03	3.27E+01	2.67E-04	2.08E+03

Table A-15 Adsolubilization of Acetophenone of CTAB/Triton ratio 1:3
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Equation from UV Y= 14880X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Adsorption = 290 μmol/g silica

									Supernatant			
[Ace] initial (μliter)	[Ace] initial (g/l)	[Ace] initial (mol/l)	Absorbance	[Ace] eq (mol/l)	[Ace] ads (mol/l)	[Ace] ads (μmol/l)	[Ace] ads (μmol/g silica)	X admicelle	Mol of Ace	Mol of H_2O	X bulk	K
100	1.74E-01	1.45E-03	1.54E+01	1.04E-03	4.14E-04	4.14E+02	1.66E+01	5.41E-02	6.11E-04	3.28E+01	1.87E-05	2.90E+03
500	8.70E-01	7.25E-03	9.30E+01	6.25E-03	1.00E-03	1.00E+03	4.01E+01	1.21E-01	3.69E-03	3.28E+01	1.13E-04	1.08E+03
1000	1.74E+00	1.45E-02	1.68E+02	1.13E-02	3.23E-03	3.23E+03	1.29E+02	3.08E-01	6.65E-03	3.27E+01	2.03E-04	1.52E+03
1500	2.61E+00	2.18E-02	2.53E+02	1.70E-02	4.78E-03	4.78E+03	1.91E+02	3.97E-01	1.00E-02	3.27E+01	3.06E-04	1.30E+03
2000	3.48E+00	2.90E-02	3.24E+02	2.18E-02	7.25E-03	7.25E+03	2.90E+02	5.00E-01	1.28E-02	3.27E+01	3.93E-04	1.27E+03

TableA-16 Adsolubilization of Toluene with Acetophenone 0.87 mmol/l of CTAB
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 15924X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 700 μmol/g silica

[Tol] initial (μl	[Tol] initial mol/l	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
50	7.99E-04	1.72E+05	3.44E-04	1.82E+01	8.97E+00	5.64E-04	3.55E+01	2.41E-02	6.19E-06	3.90E+03
100	1.60E-03	3.22E+05	6.45E-04	3.81E+01	8.96E+00	5.63E-04	3.55E+01	4.93E-02	1.16E-05	4.25E+03
200	3.19E-03	6.76E+05	1.35E-03	7.37E+01	8.97E+00	5.63E-04	3.55E+01	9.10E-02	2.44E-05	3.74E+03
300	4.79E-03	9.23E+05	1.85E-03	1.18E+02	8.96E+00	5.63E-04	3.55E+01	1.38E-01	3.32E-05	4.15E+03
350	5.59E-03	1.11E+06	2.22E-03	1.35E+02	8.97E+00	5.63E-04	3.55E+01	1.55E-01	4.00E-05	3.87E+03

TableA-17 Adsolubilization of Toluene with Acetophenone 0.87 mmol/l of Triton
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 17595X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 229 μmol/g silica

[Tol] initial (μl)	[Tol] initial mol/l	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
50	7.99E-04	2.86E+05	5.71E-04	9.09E+00	1.01E+01	5.76E-04	3.50E+01	3.33E-02	1.03E-05	3.24E+03
100	1.60E-03	5.37E+05	1.07E-03	2.10E+01	1.01E+01	5.75E-04	3.50E+01	7.36E-02	1.93E-05	3.81E+03
200	3.19E-03	1.03E+06	2.06E-03	4.53E+01	1.01E+01	5.75E-04	3.50E+01	1.46E-01	3.71E-05	3.95E+03
300	4.79E-03	1.48E+06	2.97E-03	7.30E+01	1.01E+01	5.74E-04	3.50E+01	2.17E-01	5.34E-05	4.05E+03
350	5.59E-03	1.72E+06	3.44E-03	8.61E+01	1.01E+01	5.76E-04	3.50E+01	2.46E-01	6.19E-05	3.97E+03

TableA-18 Adsolubilization of Toluene with Acetophenone 0.87 mmol/l of CTAB/Triton ratio 1:1
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 19372X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 332 μmol/g silica

[Tol] initial (μl)	[Tol] initial mol/l	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
50	7.99E-04	2.28E+05	4.56E-04	1.37E+01	9.03E+00	4.66E-04	3.93E+01	3.56E-02	8.21E-06	4.33E+03
100	1.60E-03	4.44E+05	8.88E-04	2.84E+01	9.05E+00	4.67E-04	3.93E+01	7.10E-02	1.60E-05	4.44E+03
200	3.19E-03	8.20E+05	1.64E-03	6.22E+01	9.05E+00	4.67E-04	3.93E+01	1.44E-01	2.95E-05	4.86E+03
300	4.79E-03	1.21E+06	2.42E-03	9.50E+01	9.04E+00	4.67E-04	3.93E+01	2.04E-01	4.35E-05	4.68E+03
350	5.59E-03	1.37E+06	2.73E-03	1.14E+02	9.05E+00	4.67E-04	3.93E+01	2.35E-01	4.92E-05	4.79E+03

TableA-19 Adsolubilization of Toluene with Acetophenone 0.87 mmol/l of CTAB/Triton ratio 3:1
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 21282X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption =454 μmol/g silica

[Tol] initial (μl)	[Tol] initial mol/l	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
50	7.99E-04	1.89E+05	3.77E-04	1.69E+01	9.71E+00	4.56E-04	3.97E+01	3.30E-02	6.79E-06	4.86E+03
100	1.60E-03	3.53E+05	7.06E-04	3.57E+01	9.71E+00	4.56E-04	3.98E+01	6.74E-02	1.27E-05	5.30E+03
200	3.19E-03	6.95E+05	1.39E-03	7.22E+01	9.70E+00	4.56E-04	3.98E+01	1.28E-01	2.50E-05	5.10E+03
300	4.79E-03	1.05E+06	2.11E-03	1.07E+02	9.71E+00	4.56E-04	3.98E+01	1.79E-01	3.79E-05	4.71E+03
350	5.59E-03	1.22E+06	2.44E-03	1.26E+02	9.71E+00	4.56E-04	3.98E+01	2.03E-01	4.39E-05	4.63E+03

TableA-20 Adsolubilization of Toluene with Acetophenone 0.87 mmol/l of CTAB/Triton ratio 1:3
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 14880X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 290 μmol/g silica

[Tol] initial (μl)	[Tol] initial mol/l	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
50	7.99E-04	2.48E+05	4.95E-04	1.21E+01	9.93E+00	6.85E-04	3.06E+01	3.65E-02	8.91E-06	4.10E+03
100	1.60E-03	4.76E+05	9.52E-04	2.58E+01	9.93E+00	6.85E-04	3.06E+01	7.45E-02	1.71E-05	4.35E+03
200	3.19E-03	9.11E+05	1.82E-03	5.49E+01	9.93E+00	6.86E-04	3.06E+01	1.46E-01	3.28E-05	4.46E+03
300	4.79E-03	1.34E+06	2.68E-03	8.47E+01	9.93E+00	6.86E-04	3.06E+01	2.09E-01	4.82E-05	4.34E+03
350	5.59E-03	1.50E+06	2.99E-03	1.04E+02	9.93E+00	6.85E-04	3.06E+01	2.45E-01	5.39E-05	4.54E+03

Table A-21 Adsolubilization of Acetophenone with Toluene 5.59 mmol/l of CTAB
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 15924X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 700 μmol/g silica

[Ace] initial (μl)	[Ace] initial mol/l	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
100	1.45E-03	7.13E+00	4.47E-04	4.01E+01	1.23E+06	2.45E-03	1.25E+02	4.64E-02	8.06E-06	5.75E+03
500	7.25E-03	5.57E+01	3.50E-03	1.50E+02	1.28E+06	2.57E-03	1.21E+02	1.55E-01	6.30E-05	2.45E+03
1000	1.45E-02	1.24E+02	7.79E-03	2.69E+02	1.29E+06	2.59E-03	1.20E+02	2.47E-01	1.40E-04	1.76E+03
1500	2.18E-02	1.93E+02	1.21E-02	3.85E+02	1.24E+06	2.47E-03	1.25E+02	3.18E-01	2.19E-04	1.46E+03
2000	2.90E-02	2.56E+02	1.61E-02	5.18E+02	1.27E+06	2.55E-03	1.22E+02	3.87E-01	2.90E-04	1.33E+03

Table A-22 Adsolubilization of Acetophenone with Toluene 5.59 mmol/l of Triton
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 17595X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 229 μmol/g silica

[Ace] initial (μl)	[Ace] initial mol/l	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
100	1.45E-03	1.43E+01	8.11E-04	2.56E+01	1.81E+06	3.63E-03	7.86E+01	7.68E-02	1.46E-05	5.26E+03
500	7.25E-03	8.33E+01	4.73E-03	1.01E+02	1.82E+06	3.63E-03	7.82E+01	2.47E-01	8.53E-05	2.90E+03
1000	1.45E-02	1.50E+02	8.50E-03	2.40E+02	1.82E+06	3.65E-03	7.78E+01	4.39E-01	1.53E-04	2.87E+03
1500	2.18E-02	2.18E+02	1.24E-02	3.75E+02	1.81E+06	3.62E-03	7.90E+01	5.49E-01	2.23E-04	2.46E+03
2000	2.90E-02	2.77E+02	1.57E-02	5.31E+02	1.82E+06	3.64E-03	7.79E+01	6.34E-01	2.84E-04	2.23E+03

Table A-23 Adsolubilization of Acetophenone with Toluene 5.59 mmol/l of CTAB/Triton ratio 1:1
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 19372X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 332 μmol/g silica

[Ace] initial (μl)	[Ace] initial mol/l	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
100	1.45E-03	1.54E+01	7.96E-04	2.62E+01	1.67E+06	3.33E-03	9.03E+01	5.84E-02	1.43E-05	4.07E+03
500	7.25E-03	7.77E+01	4.01E-03	1.30E+02	1.67E+06	3.33E-03	9.04E+01	2.35E-01	7.22E-05	3.25E+03
1000	1.45E-02	1.55E+02	8.01E-03	2.60E+02	1.66E+06	3.32E-03	9.09E+01	3.81E-01	1.44E-04	2.64E+03
1500	2.18E-02	2.24E+02	1.16E-02	4.07E+02	1.67E+06	3.33E-03	9.03E+01	4.91E-01	2.09E-04	2.35E+03
2000	2.90E-02	2.86E+02	1.48E-02	5.69E+02	1.67E+06	3.33E-03	9.03E+01	5.74E-01	2.67E-04	2.15E+03

Table A-24 Adsolubilization of Acetophenone with Toluene 5.59 mmol/l of CTAB/Triton ratio 3:1
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 21282X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 454 μmol/g silica

[Ace] initial (μl)	[Ace] initial mol/l	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
100	1.45E-03	1.42E+01	6.69E-04	3.13E+01	1.35E+06	2.70E-03	1.16E+02	5.20E-02	1.20E-05	4.32E+03
500	7.25E-03	7.33E+01	3.44E-03	1.52E+02	1.35E+06	2.70E-03	1.15E+02	2.11E-01	6.20E-05	3.40E+03
1000	1.45E-02	1.34E+02	6.31E-03	3.28E+02	1.35E+06	2.70E-03	1.15E+02	3.65E-01	1.14E-04	3.22E+03
1500	2.18E-02	1.98E+02	9.28E-03	4.99E+02	1.35E+06	2.70E-03	1.16E+02	4.67E-01	1.67E-04	2.79E+03
2000	2.90E-02	2.71E+02	1.27E-02	6.52E+02	1.35E+06	2.70E-03	1.16E+02	5.34E-01	2.29E-04	2.33E+03

Table A-25 Adsolubilization of Acetophenone with Toluene 5.59 mmol/l of CTAB/Triton ratio 1:3
Weight of silica = 14.75 g
Molecular weight of acetophenone = 120 g/mol
Molecular weight of toluene = 92 g/mol
Equation from GC Y= 5E+08X
Where Y = Area of toluene from head space gas chromatography
X = Equilibrium concentration of toluene (mol/l)
Equation from UV Y= 14880X
Where Y = absorbance from UV
X = Equilibrium concentration of acetophenone (mol/l)
Density of acetophenone = 1.027 g/ml
Density of toluene = 0.867 g/ml
Adsorption = 290 μmol/g silica

[Ace] initial (μl)	[Ace] initial mol/l	A	[Ace] eq (mol/l)	[Ace] ads (μmol/ g silica)	Area at equilibrium	[Tol]eq (mol/l)	[Tol] ads (μmol/ g silica)	Xadmicelle	Xbulk	K
100	1.45E-03	1.32E+01	8.85E-04	2.26E+01	1.69E+06	3.38E-03	8.86E+01	5.63E-02	1.59E-05	3.53E+03
500	7.25E-03	7.01E+01	4.71E-03	1.02E+02	1.69E+06	3.37E-03	8.87E+01	2.12E-01	8.49E-05	2.49E+03
1000	1.45E-02	1.47E+02	9.89E-03	1.85E+02	1.69E+06	3.37E-03	8.88E+01	3.28E-01	1.78E-04	1.84E+03
1500	2.18E-02	2.16E+02	1.45E-02	2.88E+02	1.69E+06	3.38E-03	8.85E+01	4.32E-01	2.62E-04	1.65E+03
2000	2.90E-02	2.70E+02	1.82E-02	4.34E+02	1.69E+06	3.38E-03	8.84E+01	5.34E-01	3.28E-04	1.63E+03

Sample Calculation A

Surfactant Adsorptin Isotherms

Surfactant adsorption isotherm was constructed by plotting the amount of surfactant adsorbed per gram silica versus equilibrium concentration of surfactant.

1. To convert the amount of carbon from TOC (ppm) to equilibrium concentration of CTAB (μM)

   Equation from TOC $Y = \frac{X}{0.2729}$

   X = the amount of carbon from TOC (ppm) = 553.1 ppm

   Y = equilibrium concentration of CTAB (μM) = $\frac{553.1}{0.2729}$

   = 2026.750 μM

2. Finding CTAB adsorbed concentration (μM).

   [Adsorbed CTAB] = [Initial CTAB] – [Equilibrium CTAB]

   [Initial CTAB] = 20000 μM

   [Equilibrium CTAB] = 2026.750 μM

   [Adsorbed CTAB] = 20000 – 2026.750 = 17973.250 μM

3. To convert adsorption concentration to moles of adsorption.

   $\text{Mol} = \frac{\text{Concentration x Volume}}{1000}$

   $\text{Adsorbed (μmol)} = \frac{\text{(Adsorbed (μM)) x Volume of solution}}{1000}$

   $\text{Adsorbed (μmol)} = \frac{17973.250 \times 20}{1000} = 359.465$

4. Finding CTAB adsorbed per gram silica.

   $\text{CTAB adsorbed (μmol/ g silica)} = \frac{\text{Adsorbed (μmol)}}{\text{the amount of silica (g)}}$

   $\text{CTAB adsorbed (μmol/ g silica)} = \frac{359.465}{0.5} = 718.930$

Sample Calculation B

Partition Coefficient

$$K = \frac{X_{admicelle}}{X_{bulk}}$$

Where $X_{admicelle}$ = mol fraction of solute in the surfactant coverage.

X_{bulk} = mol fraction of solute in the bulk.

Adsolubilization of acetophenone (CTAB) at pH 8

Weight of silica = 14.75 g

Molecular weight of acetophenone = 120 g/mol

Equation from UV Y = 15924 X

Where Y = Absorbance

X = Equilibrium concentration of acetophenone

$\rho_{acetophenone}$ = 1.027 g/ml

Maximum adsorption of CTAB = 700 μmol/g silica

Initial concentration of acetophenone (g/l) convert to (mol/l)

$$[Aceto, mol/l] = \frac{[Aceto, g/l]}{Molecular\ weight}$$

$$[Aceto, mol/l] = \frac{1.74E\text{-}01}{120} = 1.45E\text{-}03$$

At equilibrium acetophenone concentration from absorbance of UV

From Y = 15924 X

Y = Absorbance = 11.1304 Replace in the equation

$$X = \frac{11.1304}{15924} = 6.99E\text{-}04\ mol/l$$

Aceto adsolubilization = [Aceto] initial – [Aceto] equilibrium

= 1.45E-03 - 6.99E-04

= 7.52E-04 mol/l

Aceto adsolubilization = 7.52E+02 μmol/l

$$\text{Aceto adsolubilization (μmol/g silica)} = \frac{([Aceto] \times volume)/1000}{14.75}$$

$$= \frac{(7.52E+02 \times 590)/1000}{14.75}$$

= 30.0639

$$X_{admicelle} = \frac{\text{Mol of acetophenone}}{\text{(Mol of adsorbed CTAB + Mol of acetophenone)}}$$

$$X_{admicelle} = \frac{30.0639}{(700+30.0639)} = 4.12E\text{-}02$$

At the supernatant

Acetophenone concentration at equilibrium is converted to mol

$$\text{Mol of aceto} = \frac{\text{concentration x volume}}{1000}$$

$$= \frac{6.99E\text{-}04 \times 590}{1000}$$

$$= 4.12E\text{-}04$$

Total volume = Volume of aceto + Volume of H_2O

$$\text{Volume of aceto (ml)} = \frac{\text{mol of aceto x MW}}{\text{Density}}$$

$$= \frac{4.12E\text{-}04 \times 120}{1.027}$$

$$= 4.82E\text{-}02$$

Volume of H_2O = Total volume – Volume of acetophenone

= 590 ml – 4.82E-02 ml

= 5.90E+02 ml

Assume density of water = 1 g/ml

Mass of H_2O = Volume of H_2O

= 5.90E+02 g

$$\text{Mol of } H_2O = \frac{\text{Mass of } H_2O}{18} = \frac{5.90E+02}{18} = 3.28E+01$$

$$X_{bulk} = \frac{\text{Mol of acetophenone}}{\text{Mol of } H_2O + \text{Mol of acetophenone}}$$

$$= \frac{4.12E\text{-}04}{(3.28E+01 + 4.12E\text{-}04)}$$

$$= 1.26E\text{-}05$$

$$K = \frac{X_{admicelle}}{X_{bulk}} = \frac{4.12E\text{-}02}{3.26E\text{-}05} = 3.27E+03$$

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