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APPENDICES

Appendix A Viscosity Data for Aqueous PEO, HTAC, PEO-HTAC, PEO-HTAC-NaSal solutions at 30°C

A1 Viscosity data for aqueous PEO solutions at 30°C

A1.1 PEO (quoted $M_w = 1.0x10^5$ g/mol)

c_p (g/l)	η_{sp}/c (l/g)						[η] l/g	K_H
	Run 1	Run 2	Run 3	Run 4	Run 5	Std.deviation (±)		
1.5	0.1006	0.0989	0.0995	0.1104	0.1094	0.0056		
2.0	0.1077	0.1032	0.1020	0.1055	0.1055	0.0022	0.100	0.27
3.0	0.1080	0.1073	0.1067	0.1094	0.1095	0.0012		
5.0	0.1149	0.1145	0.1144	0.1168	0.1162	0.0011		

c_p (g/l)	$\ln \eta_r/c$ (l/g)						[η] l/g	K_H
	Run 1	Run 2	Run 3	Run 4	Run 5	Std.deviation (±)		
1.5	0.0937	0.0922	0.0928	0.1022	0.1013	0.0049		
2.0	0.0976	0.0938	0.0928	0.0957	0.0958	0.0019	0.100	0.27
3.0	0.0936	0.0930	0.0925	0.0946	0.0947	0.0010		
5.0	0.0908	0.0906	0.0905	0.0920	0.0916	0.0007		

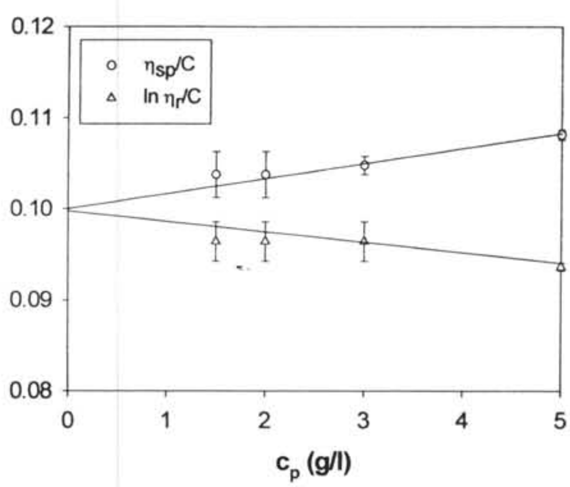


Figure 1.1 η_{sp}/c and $\ln \eta_r/c$ as a function of PEO concentration, c_p for PEO (M_w = $1.0x10^5$ g/mol) at 30°C.

A1.2 PEO (quoted $M_w = 3.0x10^5$ g/mol)

c_p (g/l)	η_{sp}/c (l/g)				[η] l/g	K_H
	Run 1	Run 2	Run 3	Std.deviation (±)		
1.0	0.2657	0.2680	0.2679	0.0013	0.240	0.28
1.5	0.2850	0.2841	0.2830	0.0010		
2.0	0.2989	0.2968	0.2975	0.0011		
2.5	0.3161	0.3149	0.3142	0.0010		

c_p (g/l)	ln η_r/c (l/g)				[η] l/g	K_H
	Run 1	Run 2	Run 3	Std.deviation (±)		
1.5	0.2356	0.2375	0.2374	0.0011	0.240	0.28
2.0	0.2373	0.2367	0.2359	0.0007		
3.0	0.2343	0.2330	0.2335	0.0007		
5.0	0.2330	0.2323	0.2319	0.0006		

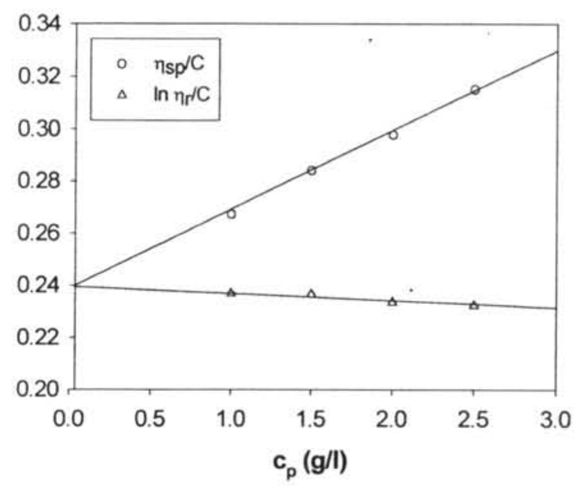


Figure 1.2 η_{sp}/c and ln η_r/c as a function of PEO concentration, c_p for PEO (M_w = $3.0x10^5$ g/mol) at 30°C.

A1.3 PEO (quoted $M_w = 6.0x10^5$ g/mol)

c_p (g/l)	η_{sp}/c (l/g)						[η] l/g	K_H
	Run 1	Run 2	Run 3	Run 4	Run 5	Std.deviation (±)		
1.0	0.4875	0.4706	0.4650	0.4717	0.4687	0.0087		
1.5	0.5059	0.5035	0.5133	0.5026	0.5009	0.0049		
2.0	0.5413	0.5379	0.5347	0.5402	0.5373	0.0026	0.412	0.37
2.5	0.5730	0.5800	0.5762	0.5722	0.5776	0.0032		
3.0	0.5876	0.5957	0.5879	0.5861	0.5836	0.0045		

c_p (g/l)	$\ln \eta_r/c$ (l/g)						[η] l/g	K_H
	Run 1	Run 2	Run 3	Run 4	Run 5	Std.deviation (±)		
1.0	0.3971	0.3857	0.3819	0.3864	0.3844	0.0058		
1.5	0.3764	0.3751	0.3806	0.3746	0.3736	0.0027		
2.0	0.3668	0.3652	0.3636	0.3663	0.3649	0.0013	0.412	0.37
2.5	0.3556	0.3584	0.3569	0.3552	0.3575	0.0013		
3.0	0.3387	0.3417	0.3389	0.3382	0.3373	0.0017		

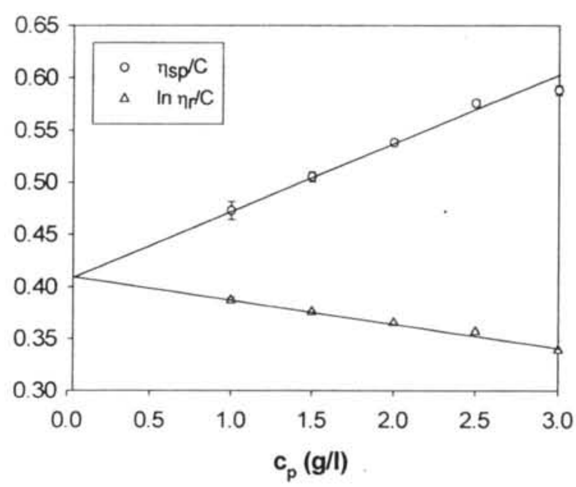


Figure 1.3 η_{sp}/c and $\ln \eta_r/c$ as a function of PEO concentration, c_p for PEO (M_w = $6.0x10^5$ g/mol) at 30°C.

A1.4 PEO (quoted $M_w = 9.0x10^5$ g/mol)

c_p (g/l)	η_{sp}/c (l/g)						[η] l/g	K_H
	Run 1	Run 2	Run 3	Run 4	Run 5	Std.deviation (±)		
0.4	0.5317	0.5231	0.5023	0.5215	0.5256	0.0111		
0.6	0.5236	0.5232	0.5170	0.5312	0.5249	0.0051		
0.8	0.5468	0.5407	0.5322	0.5354	0.5417	0.0057	0.503	0.26
1.0	0.5427	0.5400	0.5320	0.5430	0.5425	0.0047		
1.2	0.5636	0.5634	0.5507	0.5629	0.5589	0.0055		

c_p (g/l)	$\ln \eta_r/c$ (l/g)						[η] l/g	K_H
	Run 1	Run 2	Run 3	Run 4	Run 5	Std.deviation (±)		
0.4	0.4821	0.4750	0.4578	0.4737	0.4771	0.0092		
0.6	0.4553	0.4551	0.4503	0.4611	0.4563	0.0038		
0.8	0.4536	0.4493	0.4433	0.4456	0.4501	0.0040	0.503	0.26
1.0	0.4336	0.4318	0.4266	0.4338	0.4334	0.0030		
1.2	0.4305	0.4304	0.4228	0.4301	0.4277	0.0033		

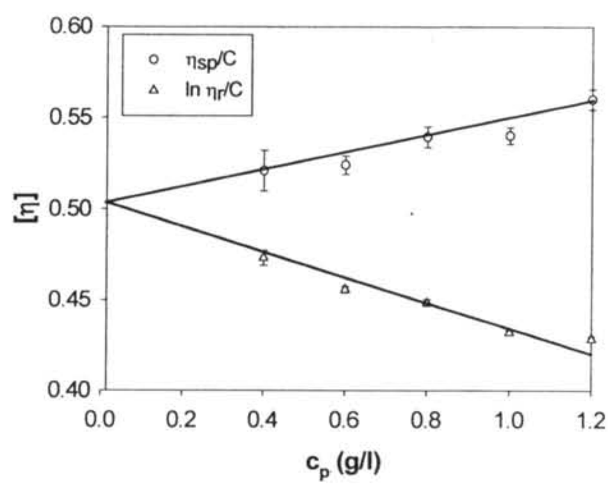


Figure 1.4 η_{sp}/c and $\ln \eta_r/c$ as a function of PEO concentration, c_p for PEO (M_w = $9.0x10^5$ g/mol) at 30°C.

A1.5 PEO (quoted $M_w = 4.0x10^6$ g/mol)

c_p (g/l)	η_{sp}/c (l/g)				[η] l/g	K_H
	Run 1	Run 2	Run 3	Std.deviation (±)		
0.2	0.9904	0.9808	1.0015	0.0104		
0.4	1.0472	1.0570	1.0541	0.0050	0.9500	0.31
0.6	1.1093	1.1006	1.0977	0.0060		
0.8	1.1664	1.1664	1.1664	0.0000		

c_p (g/l)	ln η_r/c (l/g)				[η] l/g	K_H
	Run 1	Run 2	Run 3	Std.deviation (±)		
0.2	0.9036	0.8956	0.9128	0.0086		
0.4	0.8747	0.8816	0.8795	0.0035	0.9500	0.31
0.6	0.8503	0.8450	0.8433	0.0037		
0.8	0.8239	0.8239	0.8239	0.0000		

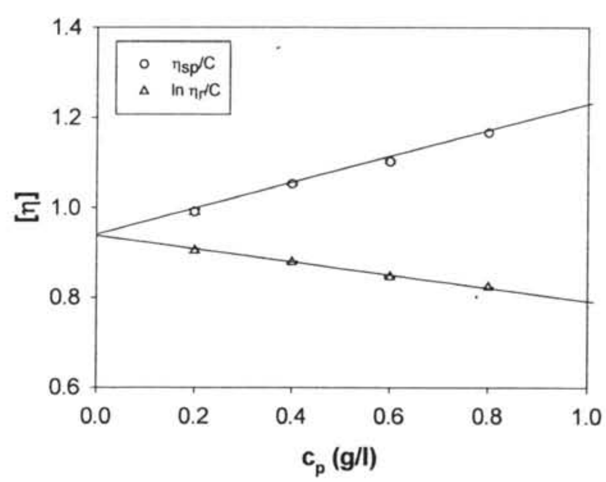


Figure 1.5 η_{sp}/c and ln η_r/c as a function of PEO concentration, c_p for PEO (M_w = $40.0x10^5$ g/mol) at 30°C.

A2 Viscosity data for aqueous HTAC solutions at 30°C

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.00	0.0000	0.0000	0.0000	0.0000
0.20	0.0011	0.0007	0.0008	0.0002
0.40	0.0009	0.0003	0.0007	0.0003
0.60	0.0011	0.0008	0.0002	0.0005
0.80	0.0027	0.0035	0.0022	0.0007
1.00	0.0038	0.0021	0.0053	0.0016
1.20	0.0040	0.0033	0.0053	0.0010
1.40	0.0050	0.0031	0.0031	0.0011
1.50	0.0035	0.0034	0.0031	0.0002
2.00	0.0000	0.0078	0.0068	0.0042
3.00	0.0102	0.0111	0.0108	0.0005
4.00	0.0171	0.0155	0.0167	0.0008
5.00	0.0232	0.0234	0.0238	0.0003

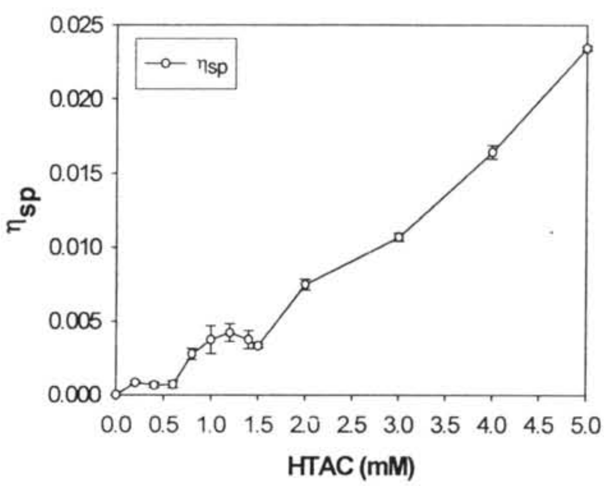


Figure 2.1 η_{sp} as a function of HTAC concentration in aqueous solutions at 30°C.

A3 Viscosity data for aqueous PEO-HTAC solutions at 30°C

A3.1 Viscosity data for aqueous PEO1_40 ppm - HTAC solutions at 30°C (PEO1 = PEO M_w 0.91 x 10^5 g/mol)

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.000	0.0062	0.0070	0.0065	0.0004
0.05	0.0037	0.0037	0.0045	0.0005
0.10	0.0033	0.0037	0.0030	0.0004
0.15	0.0032	0.0034	0.0031	0.0002
0.20	0.0035	0.0032	0.0031	0.0002
0.25	0.0040	0.0040	0.0037	0.0002
0.30	0.0042	0.0041	0.0044	0.0002
0.40	0.0042	0.0041	0.0045	0.0002
0.50	0.0049	0.0041	0.0045	0.0004
0.60	0.0054	0.0047	0.0052	0.0004
0.70	0.0054	0.0054	0.0053	0.0001
0.80	0.0057	0.0058	0.0056	0.0001
0.90	0.0059	0.0053	0.0057	0.0003
1.00	0.0063	0.0063	0.0062	0.0001
3.00	0.0149	0.0152	0.0161	0.0006
5.00	0.0268	0.0278	0.0272	0.0005

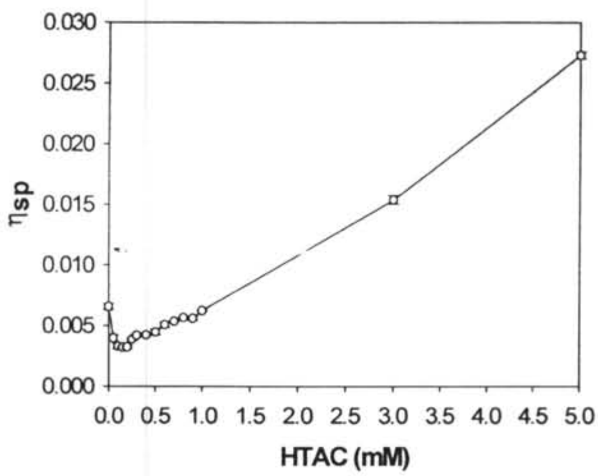


Figure 3.1 η_{sp} as a function of PEO1_40 ppm + HTAC in aqueous solutions at 30°C.

A3.2 Viscosity data for aqueous PEO1_200 ppm - HTAC solutions at 30°C (PEO1 = PEO M_w 0.91 x 10^5 g/mol)

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.00	0.0211	0.0213	0.0205	0.0004
0.10	0.0195	0.0198	0.0201	0.0003
0.20	0.0183	0.0186	0.0188	0.0003
0.30	0.0176	0.0176	0.0183	0.0004
0.40	0.0179	0.0180	0.0179	0.0001
0.50	0.0186	0.0182	0.0180	0.0003
0.60	0.0175	0.0179	0.0177	0.0002
0.70	0.0179	0.0184	0.0178	0.0003
0.80	0.0184	0.0181	0.0178	0.0003
0.90	0.0193	0.0192	0.0192	0.0001
1.00	0.0199	0.0195	0.0194	0.0003
2.00	0.0255	0.0250	0.0247	0.0004
3.00	0.0329	0.0334	0.0337	0.0004
5.00	0.0439	0.0442	0.0443	0.0002

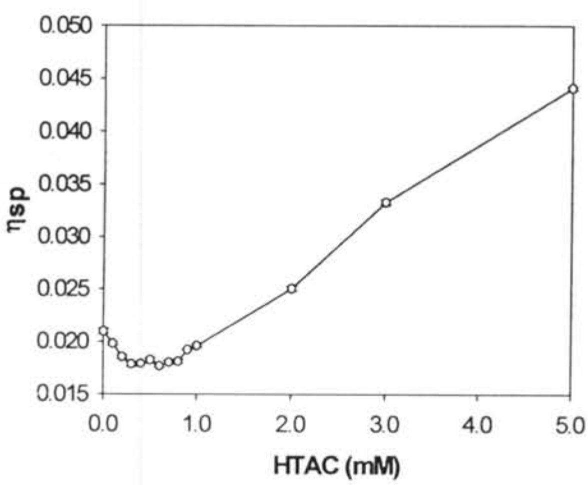


Figure 3.2 η_{sp} as a function of PEO1_200 ppm + HTAC in aqueous solutions at 30°C.

A3.3 Viscosity data for aqueous PEO1_1000 ppm - HTAC solutions at 30°C
(PEO1 = PEO M_w 0.91 x 10^5 g/mol)

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.00	0.1275	0.1271	0.1254	0.0011
1.00	0.1183	0.1180	0.1163	0.0011
2.00	0.1151	0.1123	0.1118	0.0018
3.00	0.1274	0.1209	0.1239	0.0033
4.00	0.1399	0.1354	0.1357	0.0025
5.00	0.1410	0.1413	0.1410	0.0002
6.00	0.1500	0.1513	0.1518	0.0009
7.00	0.1582	0.1578	0.1609	0.0017
8.00	0.1652	0.1640	0.1641	0.0007
9.00	0.1745	0.1716	0.1736	0.0015
10.00	0.1608	0.1615	0.1693	0.0047
12.00	0.1578	0.1573	0.1585	0.0006
14.00	0.1562	0.1524	0.1503	0.0030
16.00	0.1479	0.1467	0.1457	0.0011

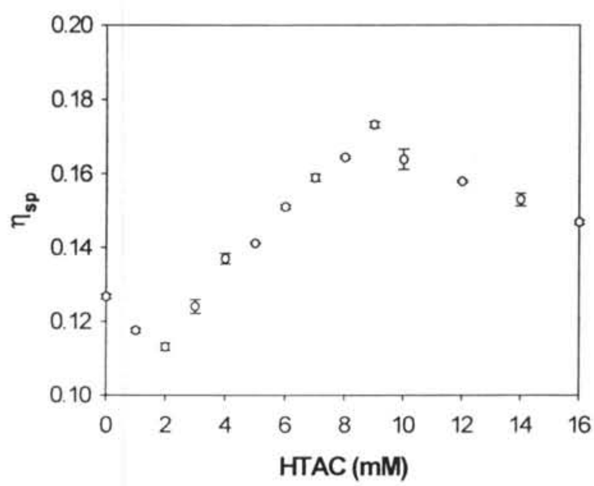


Figure 3.3 η_{sp} as a function of PEO1_1000 ppm + HTAC in aqueous solutions at 30°C.

A3.4 Viscosity data for aqueous PEO6_40 ppm - HTAC solutions at 30°C (PEO6 = PEO M_w 6.06 x 10^5 g/mol)

HTAC (mM)	η_{sp}				
	Run 1	Run 2	Run 3	Run 4	Std. deviation (±)
0.00	0.0143	0.0143	0.0143	-	0.0000
0.06	0.0236	0.0238	0.0241	-	0.0003
0.07	0.0238	0.0241	0.0233	-	0.0004
0.18	0.0280	0.0250	0.0269	-	0.0015
0.35	0.0277	0.0271	0.0399	0.0291	0.0060
0.50	0.0348	0.0318	0.0287	0.0307	0.0025
0.60	0.0306	0.0318	0.0340	0.0476	0.0079
0.80	0.0485	0.0507	0.0463	-	0.0022
1.00	0.0697	0.0602	0.0517	0.0552	0.0078
1.50	0.0428	0.0488	0.0488	0.0532	0.0043
2.00	0.0360	0.0536	0.0448	0.0515	0.0079
2.50	0.0421	-	-		0.0000
3.00	0.0422	0.0414	0.0454	-	0.0021
4.00	0.0427	0.0475	0.0390	0.0443	0.0035
5.00	0.0474	0.0474	0.0476	-	0.0001

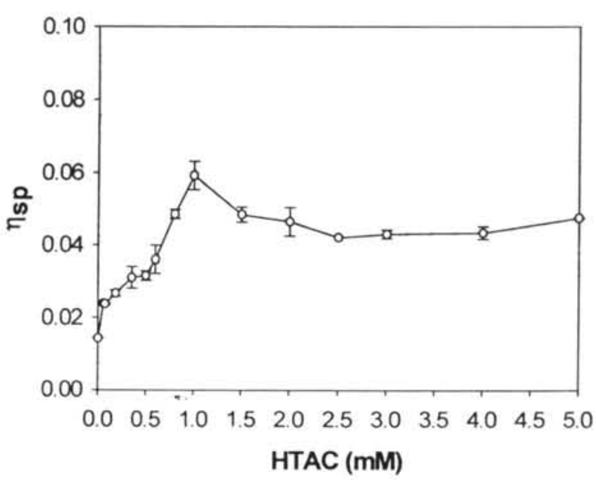


Figure 3.4 η_{sp} as a function of PEO6_40 ppm + HTAC in aqueous solutions at 30°C.

A3.5 Viscosity data for aqueous PEO6_200 ppm - HTAC solutions at 30°C (PEO6 = PEO M_w 6.06 x 10^5 g/mol)

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.00	0.0097	0.0072	0.0074	0.0014
0.02	0.0844	0.0877	0.0863	0.0017
0.04	0.0859	0.0846	0.0833	0.0013
0.06	0.0814	0.0830	0.0819	0.0008
0.10	0.0801	0.0795	0.0789	0.0006
0.15	0.0862	0.0817	0.0859	0.0025
0.20	0.0849	0.0868	0.0872	0.0012
0.30	0.0850	0.0843	0.0842	0.0004
0.40	0.0854	0.0845	0.0851	0.0005
0.50	0.0896	0.0896	0.0896	0.0000
1.00	0.0910	-	-	0.0000
1.30	0.0940	-	0.0939	0.0001
2.00	0.1336	0.1331	0.1335	0.0003
3.00	0.1267	0.1298	0.1286	0.0016
5.00	0.1331	0.1295	0.1299	0.0020

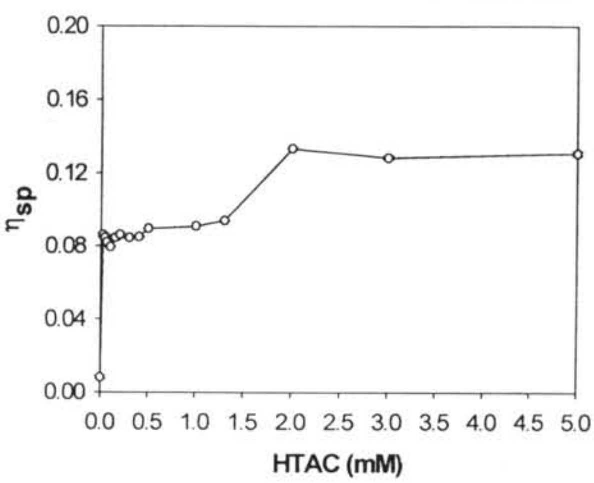


Figure 3.5 η_{sp} as a function of PEO6_200 ppm + HTAC in aqueous solutions at 30°C.

A3.6 Viscosity data for aqueous PEO20_15 ppm - HTAC solutions at 30°C (PEO20 = PEO M_w 17.90 x 10^5 g/mol)

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.00	0.0165	0.0165	0.0145	0.0012
0.05	0.0129	0.0110	0.0114	0.0010
0.10	0.0117	0.0087	0.0085	0.0018
0.15	0.0098	0.0103	0.0095	0.0004
0.20	0.0093	0.0094	0.0083	0.0006
0.30	0.0081	0.0104	0.0102	0.0013
0.40	0.0077	0.0093	-	0.0011
0.50	0.0070	0.0105	0.0082	0.0018
0.60	0.0111	0.0113	0.0088	0.0014
0.70	0.0122	0.0113	0.0117	0.0005
0.80	0.0120	0.0119	0.0120	0.0001
0.90	0.0121	0.0120	0.0119	0.0001
1.00	0.0122	0.0129	0.0121	0.0004
2.00	0.0196	0.0205	0.0200	0.0005
3.00	0.0297	0.0278	0.0275	0.0012
5.00	0.0377	0.0379	0.0376	0.0002

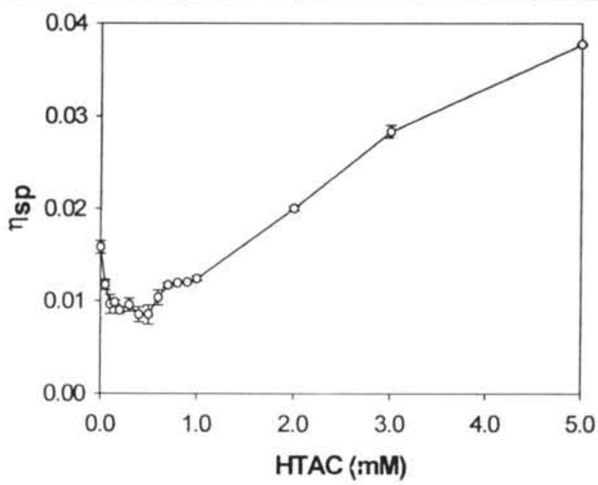


Figure 3.6 η_{sp} as a function of PEO20_15 ppm + HTAC in aqueous solutions at 30°C.

A3.7 Viscosity data for aqueous PEO20_200 ppm - HTAC solutions at 30°C
(PEO20 = PEO M_w 17.90 x 10^5 g/mol)

HTAC (mM)	η_{sp}				
	Run 1	Run 2	Run 3	Run 4	Std. deviation (±)
0.00	0.1831	0.1853	0.1856	-	0.0014
0.10	0.1876	0.1803	0.1800	0.1793	0.0039
0.20	0.1720	0.1727	0.1716	-	0.0006
0.30	0.1827	0.1816	0.1839	0.1819	0.0010
0.40	0.1922	0.1855	0.1912	0.1908	0.0030
0.50	0.1882	0 1894	0.1865	0.1992	0.0057
0.60	0.1869	0.1862	0.1854	0.1958	0.0049
0.70	0.1876	0.1874	0.1865	0.2061	0.0095
0.80	0.1940	0.1941	0.1941	-	0.0001
0.90	0.1978	0.1975	0.1949	-	0.0016
1.00	0.1969	0.1968	-	-	0.0001
2.00	0.2281	0.2279	0.2284	-	0.0003
3.00	0.2548	0.2501	0.2506	-	0.0026
5.00	0.2615	0.2621	0.2641	-	0.0014

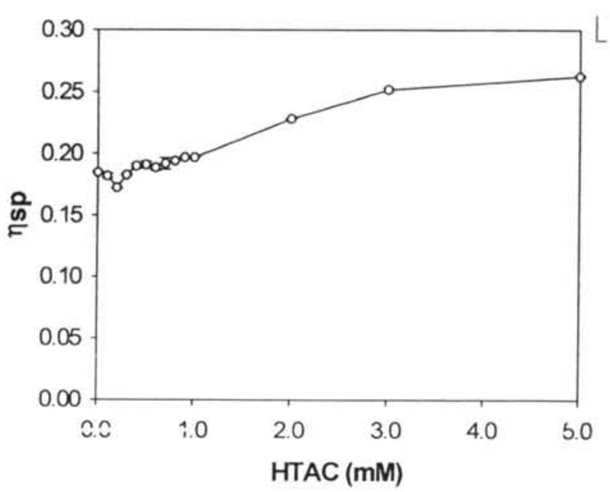


Figure 3.7 η_{sp} as a function of PEO20_200 ppm + HTAC in aqueous solutions at 30°C.

A3.8 Viscosity data for aqueous PEO20_500 ppm - HTAC solutions at 30°C
(PEO20 = PEO M_w 17.90 x 10^5 g/mol)

HTAC (mM)	η_{sp}			
	Run 1	Run 2	Run 3	Std. deviation (±)
0.00	0.5672	0.5666	0.5695	0.0015
0.20	0.4845	0.4836	0.4835	0.0006
0.40	0.4742	0.4727	0.4763	0.0018
0.60	0.4979	0.4973	0.5008	0.0019
0.80	0.5128	0.5131	0.5172	0.0025
1.00	0.5152	0.5145	0.5100	0.0028
1.20	0.5132	0.5128	0.5098	0.0019
1.40	0.5164	0.5178	0.5169	0.0007
1.80	0.6017	0.6033	0.6024	0.0008
2.00	0.6058	0.6189	0.6294	0.0118
4.00	0.6158	0.6146	0.6120	0.0019
6.00	0.5825	0.6010	0.6016	0.0109

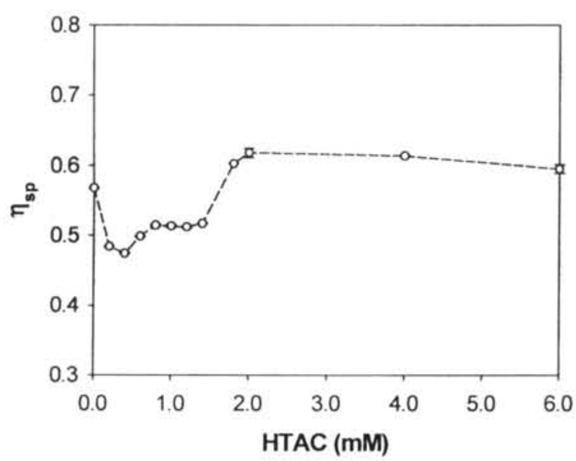


Figure 3.8 η_{sp} as a function of PEO20_500 ppm + HTAC in aqueous solutions at 30°C.

Appendix B Static and Dynamic Light Scattering Data for Aqueous PEO, HTAC, PEO-HTAC and PEO-HTAC-NaSal solutions at 30°C

B1 Static light scattering data for aqueous PEO solutions at 30°C

B1.1 PEO1 (quoted $M_w = 1.0x10^5$ g/mol)

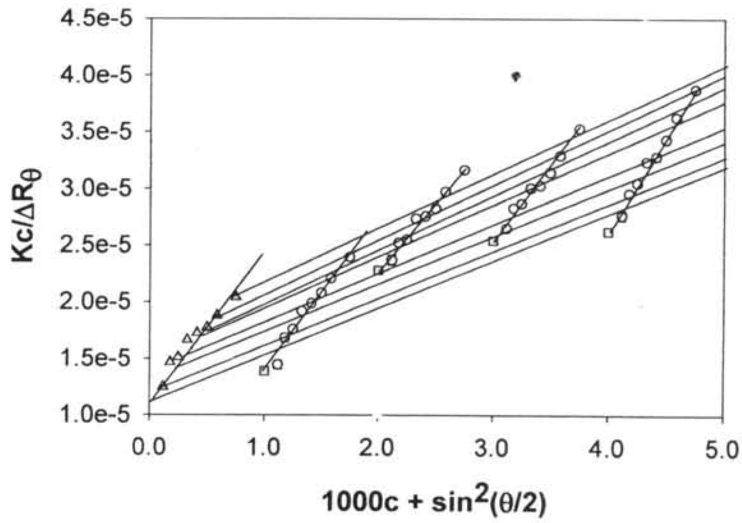


Figure 1.1 Zimm plot for PEO ($M_w = 0.91x10^5$ g/mol) in aqueous solution at 30°C.

(i) PEO = 1.0 g/l

Angle	$1000c_1 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	1.1170	1.39	1.52	1.43
50	1.1786	1.74	1.61	1.70
60	1.2500	1.77	1.72	1.79
70	1.3290	1.94	1.91	1.90
80	1.4132	2.04	1.96	1.96
90	1.5000	2.08	2.07	2.09
100	1.5868	2.24	2.20	2.18
120	1.7500	2.44	2.37	2.38

(ii) PEO = 2.0 g/l

Angle	$1000c_2 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	2.1170	2.28	2.40	2.43
50	2.1786	2.51	2.51	2.55
60	2.2500	2.55	2.54	2.57
70	2.3290	2.73	2.76	2.72
80	2.4132	2.75	2.78	2.74
90	2.5000	2.84	2.83	2.80
100	2.5868	2.97	2.97	2.98
120	2.7500	3.19	3.16	3.15

(iii) PEO = 3.0 g/l

Angle	$1000c_3 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	3.1170	2.69	2.65	2.61
50	3.1786	2.85	2.81	2.83
60	3.2500	2.85	2.87	2.89
70	3.3290	2.94	3.04	3.04
80	3.4132	2.99	3.04	3.05
90	3.5000	3.16	3.14	3.13
100	3.5868	3.33	3.30	3.25
120	3.7500	3.55	3.54	3.50

(iv) PEO = 4.0 g/l

Angle	$1000c_4 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	4.1170	2.70	2.84	2.75
50	4.1786	2.93	2.96	2.98
60	4.2500	3.03	3.02	3.10
70	4.3290	3.26	3.19	3.27
80	4.4132	3.31	3.22	3.32
90	4.5000	3.46	3.43	3.42
100	4.5868	3.65	3.64	3.60
120	4.7500	3.89	3.89	3.85

B1.2 PEO3 (quoted $M_w = 3.0x10^5$ g/mol)

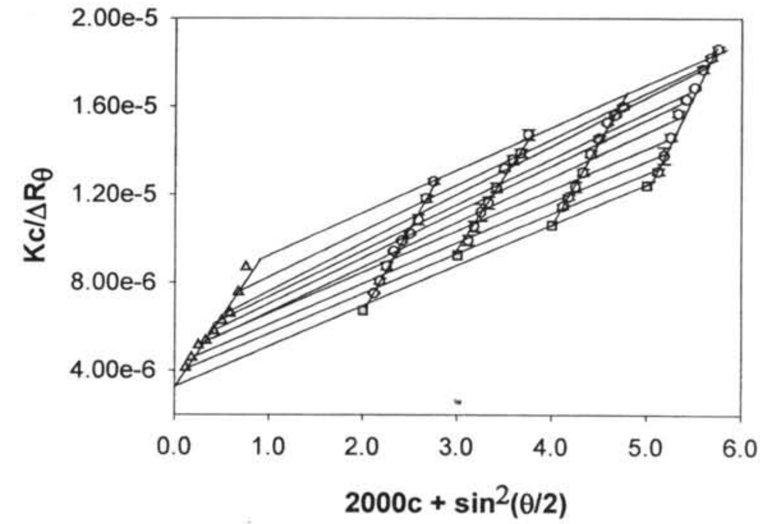


Figure 1.2 Zimm plot for PEO ($M_w = 3.04x10^5$ g/mol) in aqueous solution at 30°C.

(i) PEO = 1.0 g/l

Angle	$2000c_1 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	2.1170	0.74	0.76	0.75
50	2.1786	0.79	0.80	0.83
60	2.2500	0.86	0.91	0.86
70	2.3290	0.93	0.94	0.95
80	2.4132	0.98	0.98	1.00
90	2.5000	1.02	1.03	1.01
100	2.5868	1.06	1.06	1.13
110	2.6710	1.21	1.16	1.17
120	2.7500	1.25	1.28	1.24

(ii) PEO = 1.5 g/l

Angle	$2000c_2 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	3.1170	0.95	1.03	0.99
50	3.1786	1.03	1.03	1.10
60	3.2500	1.15	1.16	1.04
70	3.3290	1.20	1.17	1.11
80	3.4132	1.26	1.24	1.19
90	3.5000	1.30	1.31	1.34
100	3.5868	1.39	1.36	1.32
110	3.6710	1.42	1.36	1.38
120	3.7500	1.51	1.47	1.43

(iii) PEO = 2.0 g/l

Angle	$2000c_3 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	4.1170	1.12	1.15	1.16
50	4.1786	1.21	1.18	1.17
60	4.2500	1.28	1.21	1.21
70	4.3290	1.33	1.28	1.29
80	4.4132	1.41	1.38	1.36
90	4.5000	1.48	1.44	1.44
100	4.5868	1.53	1.54	1.51
110	4.6710	1.57	1.56	1.55
120	4.7500	1.60	1.58	1.61

(iv) PEO = 2.5 g/l

Angle	$2000c_4 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^5$		
		Run 1	Run 2	Run 3
40	5.1170	1.28	1.30	1.33
50	5.1786	1.36	1.32	1.45
60	5.2500	1.49	1.45	1.44
70	5.3290	1.54	1.58	1.58
80	5.4132	1.63	1.62	1.64
90	5.5000	1.69	1.67	1.69
100	5.5868	1.74	1.79	1.77
110	5.6710	1.81	1.84	1.81
120	5.7500	1.86	1.88	1.84

B1.3 PEO6 (quoted $M_w = 6.0x10^5$ g/mol)

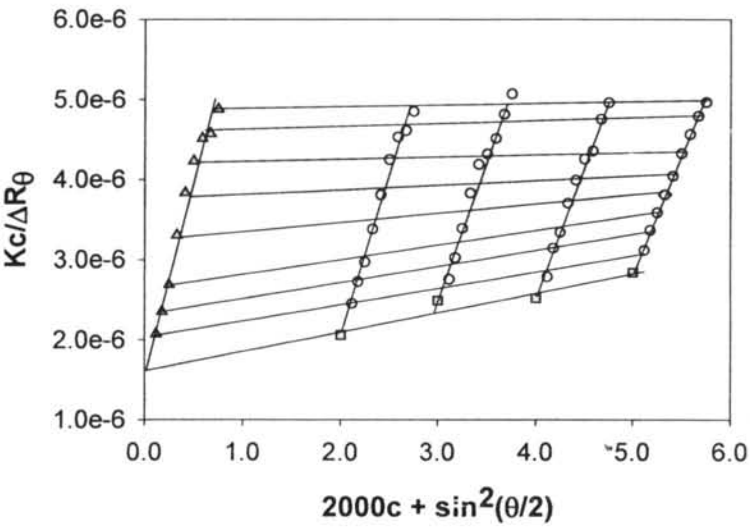


Figure 1.3 Zimm plot for PEO ($M_w = 6.06x10^5$ g/mol) in aqueous solution at 30°C.

(i) PEO = 0.5 g/l

Angle	$2000c_1 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$
40	2.1170	2.45
50	2.1786	2.73
60	2.2500	2.97
70	2.3290	3.38
80	2.4132	3.81
90	2.5000	4.25
100	2.5868	4.53
110	2.6710	4.61
120	2.7500	4.85

(ii) PEO = 1.0 g/l

Angle	$2000c_2 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$
40	3.1170	2.75
50	3.1786	3.02
60	3.2500	3.39
70	3.3290	3.83
80	3.4132	4.19
90	3.5000	4.32
100	3.5868	4.52
110	3.6710	4.82
120	3.7500	5.07

(iii) PEO = 1.5 g/l

Angle	$2000c_3 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$
40	4.1170	2.78
50	4.1786	3.14
60	4.2500	3.34
70	4.3290	3.70
80	4.4132	3.99
90	4.5000	4.26
100	4.5868	4.35
110	4.6710	4.75
120	4.7500	4.96

(iv) PEO = 2.0 g/l

Angle	$2000c_4 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$
40	5.1170	3.11
50	5.1786	3.36
60	5.2500	3.58
70	5.3290	3.80
80	5.4132	4.04
90	5.5000	4.32
100	5.5868	4.56
110	5.6710	4.79
120	5.7500	4.96

B1.4 PEO9 (quoted $M_w = 9.0x10^5$ g/mol)

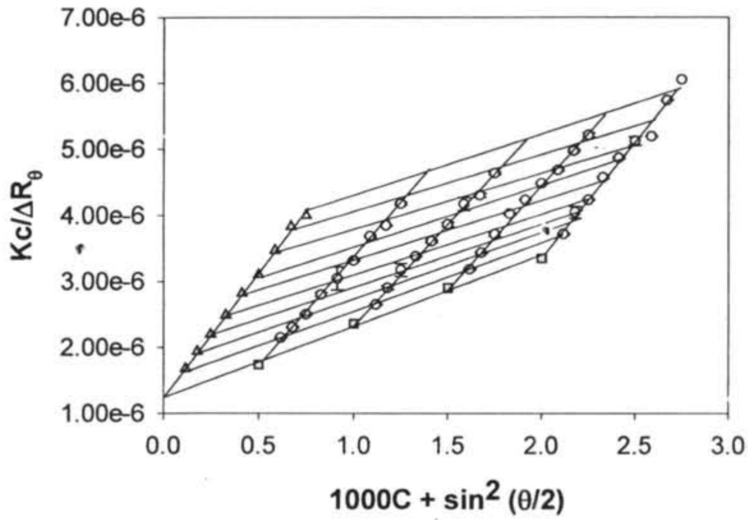


Figure 1.4 Zimm plot for PEO ($M_w = 8.03x10^5$ g/mol) in aqueous solution at 30°C.

(i) PEO = 0.5 g/l

Angle	$5000c_1 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$		
		Run 1	Run 2	Run 3
40	0.6170	2.15	2.14	2.16
50	0.6786	2.32	2.30	-
60	0.7500	2.52	2.50	2.48
70	0.8290	2.80	2.75	2.85
80	0.9132	3.35	3.05	2.75
90	1.0000	3.31	3.33	-
100	1.0868	3.70	3.66	-
110	1.1710	3.86	3.84	-
120	1.2500	4.20	4.16	-

(ii) PEO = 1.0 g/l

Angle	$5000c_2 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$		
		Run 1	Run 2	Run 3
40	1.1170	2.65	2.67	2.63
50	1.1786	2.90	2.95	2.85
60	1.2500	3.07	3.27	-
70	1.3290	3.37	3.39	-
80	1.4132	3.59	3.63	-
90	1.5000	3.89	3.83	-
100	1.5868	4.07	4.27	-
110	1.6710	4.33	4.27	-
120	1.7500	4.66	4.62	-

(iii) PEO = 1.5 g/l

Angle	$5000c_3 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$		
		Run 1	Run 2	Run 3
40	1.6170	3.20	3.16	3.18
50	1.6786	3.45	3.41	3.43
60	1.7500	3.76	3.66	3.71
70	1.8290	4.04	4.00	4.02
80	1.9132	4.24	4.23	4.25
90	2.0000	4.48	4.50	-
100	2.0868	4.67	4.71	-
110	2.1710	5.00	4.96	-
120	2.2500	5.25	5.19	

(iv) PEO = 2.0 g/l

Angle	$5000c_3 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$	
		Run 1	Run 2
40	2.1170	3.71	3.73
50	2.1786	3.96	4.14
60	2.2500	4.24	4.22
70	2.3290	4.59	4.55
80	2.4132	4.85	4.89
90	2.5000	5.19	5.06
100	2.5868	5.20	5.20
110	2.6710	5.73	5.75
120	2.7500	6.06	6.06

B1.5 PEO20 (quoted $M_w = 40.0x10^5$ g/mol)

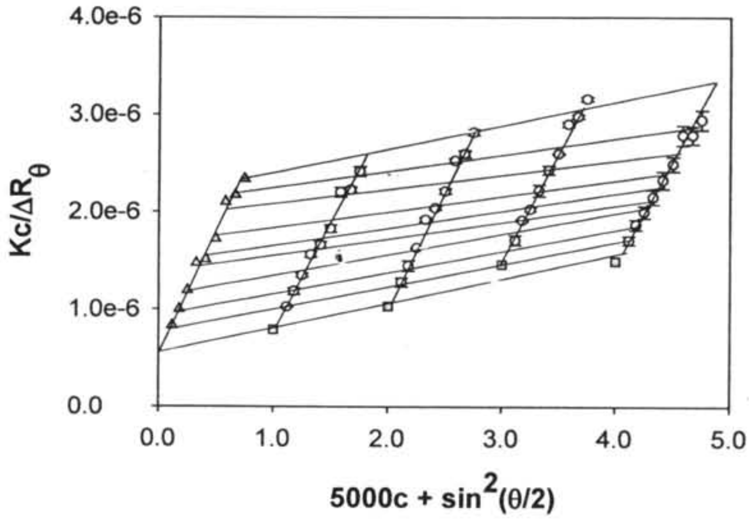


Figure 1.5 Zimm plot for PEO ($M_w = 17.9x10^5$ g/mol) in aqueous solution at 30°C.

(i) PEO = 0.2 g/l

Angle	$5000c_1 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta$ x 10^6		
		Run 1	Run 2	Run 3
40	1.1170	1.02	1.02	1.03
50	1.1786	1.19	1.24	1.12
60	1.2500	1.38	1.32	1.34
70	1.3290	1.62	1.52	1.54
80	1.4132	1.69	1.59	1.70
90	1.5000	1.83	1.89	1.76
100	1.5868	2.29	2.20	2.12
110	1.6710	2.27	2.18	2.23
120	1.7500	2.45	2.48	2.32

(ii) PEO = 0.4 g/l

Angle	$5000c_2 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$		
		Run 1	Run 2	Run 3
40	2.1170	1.19	1.34	1.31
50	2.1786	1.34	1.51	1.49
60	2.2500	1.62	1.64	1.63
70	2.3290	1.94	1.94	1.88
80	2.4132	2.03	2.07	2.02
90	2.5000	2.19	2.18	2.27
100	2.5868	2.52	2.49	2.57
110	2.6710	2.59	2.54	2.66
120	2.7500	2.83	2.76	2.86

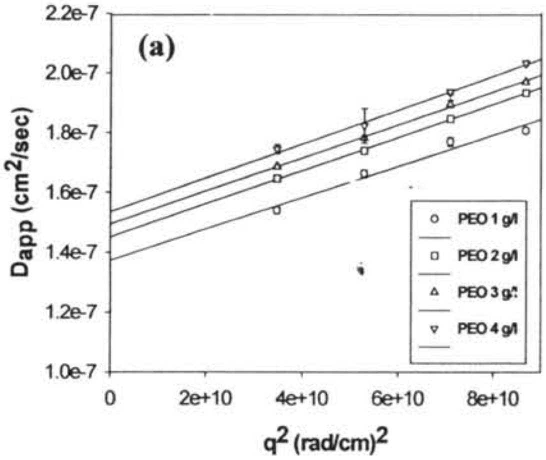
(iii) PEO = 0.6 g/l

Angle	$5000c_3 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$		
		Run 1	Run 2	Run 3
40	3.1170	1.77	1.61	1.74
50	3.1786	1.89	1.93	1.92
60	3.2500	2.06	1.99	2.03
70	3.3290	2.30	2.10	2.26
80	3.4132	2.49	2.34	2.46
90	3.5000	2.59	2.61	2.59
100	3.5868	2.94	2.85	2.91
110	3.6710	3.00	3.00	2.94
120	3.7500	3.18	3.18	3.12

(iv) PEO = 0.8 g/l

Angle	$5000c_4 + \sin^2(\theta/2)$	$Kc/\Delta R_\theta \times 10^6$			
		Run 1	Run 2	Run 3	Run 4
40	4.1170	1.73	1.70	1.64	1.60
50	4.1786	1.97	1.84	1.75	1.76
60	4.2500	2.10	2.04	1.86	1.84
70	4.3290	2.28	2.19	1.96	1.99
80	4.4132	2.49	2.36	2.10	2.14
90	4.5000	2.63	2.53	2.42	2.24
100	4.5868	2.95	2.82	2.63	2.49
110	4.6710	2.95	2.80	2.66	2.52
120	4.7500	3.06	2.97	2.84	2.63

B2 Dynamic light scattering data for aqueous PEO solutions at 30°C



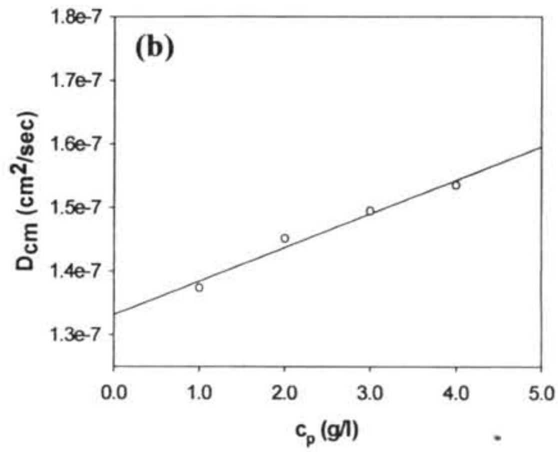


Figure 2.1 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different PEO concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of PEO concentration for PEO M_w 0.91x10^5 g/mol at 30°C.

B2.1 PEO1 (quoted M_w = 1.0x10^5 g/mol)

(i) PEO = 1.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	1.80	1.82	1.80	0.550	0.491	0.476
110	2.6628	7.0903	1.80	1.75	1.76	0.513	0.514	0.513
90	2.2987	5.2838	1.65	1.69	1.65	0.486	0.476	0.503
70	1.8646	3.4769	1.54	1.56	1.52	0.533	0.521	0.503

(ii) PEO = 2.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	1.94	1.94	1.92	0.496	0.461	0.433
110	2.6628	7.0903	1.85	1.83	1.86	0.457	0.424	0.467
90	2.2987	5.2838	1.76	1.73	1.73	0.476	0.488	0.478
70	1.8646	3.4769	1.65	1.63	1.66	0.508	0.497	0.515

(iii) PEO = 3.0 g/l

Angle (degree)	q x 10-^{5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run2	Run 3
130	2.9459	8.6784	1.98	1.96	1.97	0.620	0.593	0.585
110	2.6628	7.0903	1.92	1.89	1.88	0.608	0.607	0.594
90	2.2987	5.2838	1.77	1.79	1.79	0.641	0.705	0.632
70	1.8646	3.4769	1.69	1.68	1.69	0.691	0.661	0.662

(iv) PEO = 4.0 g/l

Angle (degree)	q x 10-^{5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run2	Run 3
130	2.9459	8.6784	2.05	2.02	2.03	0.618	0.627	0.628
110	2.6628	7.0903	1.92	1.95	1.94	0.639	0.654	0.619
90	2.2987	5.2838	1.86	1.71	1.90	0.667	0.665	0.654
70	1.8646	3.4769	1.73	-	1.76	0.698	0.704	0.698

PEO (g/l)	D_{cm} x 10^7 (cm^2/s)	D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
1.0	1.37	13.3	16.69	0.50
2.0	1.45			
3.0	1.49			
4.0	1.54			

B2.2 PEO3 (quoted M_w = 3.0x10^5 g/mol)

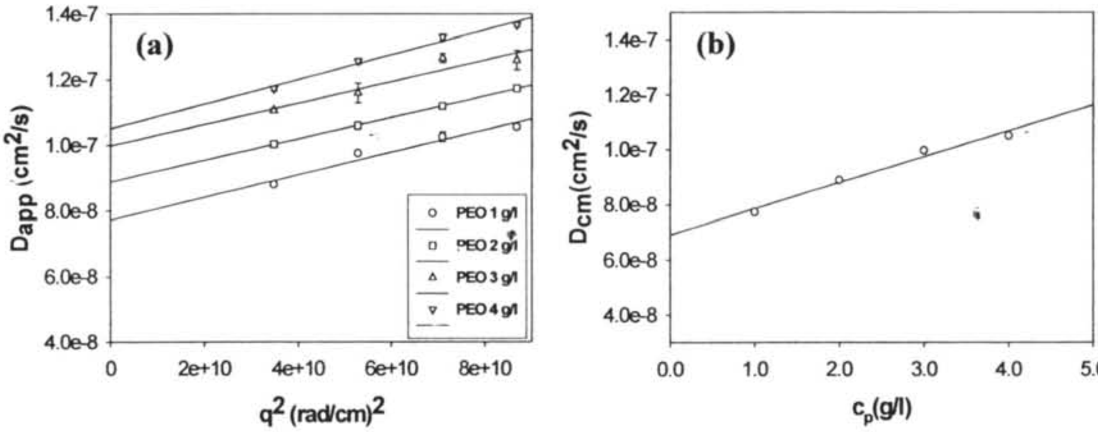


Figure 2.2 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different PEO concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of PEO concentration for PEO M_w 3.04x10^5 g/mol at 30°C.

(i) PEO = 1.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	-	1.06	1.05	0.404	0.410	0.416
110	2.6628	7.0903	1.01	-	1.04	0.415	0.428	0.422
90	2.2987	5.2838	0.97	0.98	-	0.454	0.450	0.460
70	1.8646	3.4769	0.87	0.89	0.88	0.477	0.486	0.488

(ii) PEO = 2.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	1.18	1.18	1.16	0.406	0.401	0.400
110	2.6628	7.0903	1.12	1.13	1.11	0.410	0.410	0.414
90	2.2987	5.2838	1.08	1.06	1.04	0.418	0.422	0.423
70	1.8646	3.4769	1.00	1.01	1.00	0.441	0.451	0.437

(iii) PEO = 3.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	1.23	1.23	1.32	0.430	0.430	0.435
110	2.6628	7.0903	1.29	1.24	1.27	0.442	0.443	0.446
90	2.2987	5.2838	1.10	1.18	1.20	0.450	0.457	0.450
70	1.8646	3.4769	1.10	1.10	1.127	0.527	0.540	0.472

(iv) PEO = 4.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	1.38	1.36	1.36	0.447	0.446	0.444
110	2.6628	7.0903	1.32	1.35	1.32	0.498	0.449	0.444
90	2.2987	5.2838	1.27	1.26	1.24	0.461	0.458	0.442
70	1.8646	3.4769	1.18	1.18	1.16	0.469	0.461	0.479

PEO (g/l)	D_{cm} x 10^8 (cm^2/s)	D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
1.0	7.73	7.00	31.71	0.49
2.0	8.88			
3.0	9.97			
4.0	10.51			

B2.3 PEO6 (quoted $M_w = 6.0x10^5$ g/mol)

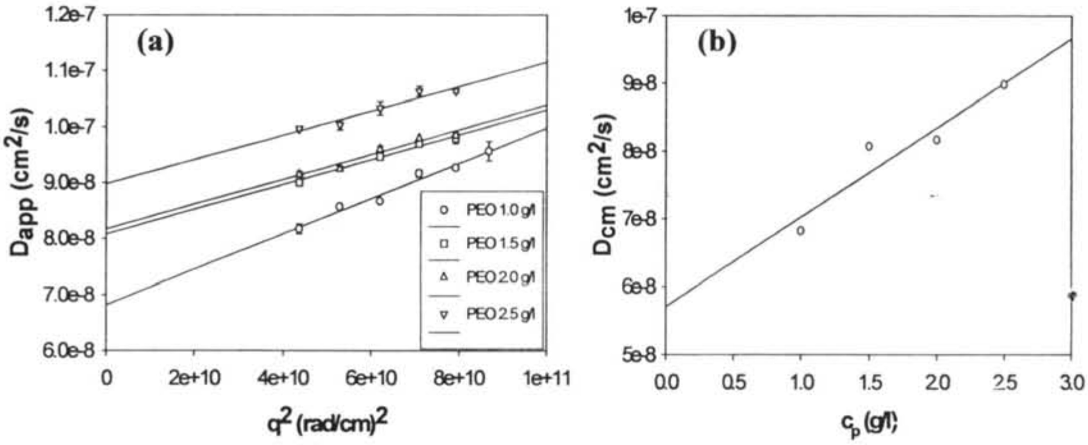


Figure 2.3 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different PEO concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of PEO concentration for PEO M_w $6.06x10^5$ g/mol at 30°C.

(i) PEO = 1.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.9459	8.6784	9.90	9.50	9.30	0.394	0.394	0.395
120	2.8151	7.9245	9.30	9.20	9.30	0.392	0.381	0.389
110	2.6628	7.0903	9.30	9.10	9.10	0.382	0.383	0.387
100	2.4902	6.2011	8.70	8.70	8.60	0.381	0.380	0.380
90	2.2987	5.2838	8.50	8.60	8.60	0.395	0.390	0.387
80	2.0896	4.3664	8.20	8.00	8.30	0.394	0.399	0.382

(ii) PEO = 1.5 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	9.60	9.90	9.90	0.421	0.403	0.402
110	2.6628	7.0903	9.70	9.70	9.70	0.400	0.395	0.398
100	2.4902	6.2011	9.40	9.50	9.50	0.397	0.397	0.392
80	2.0896	4.3664	-	-	9.00	0.416	0.381	0.390

(iii) PEO = 2.0 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	-	9.80	9.90	0.428	0.422	0.421
110	2.6628	7.0903	9.80	9.80	9.80	0.422	0.418	0.422
100	2.4902	6.2011	9.60	9.70	9.50	0.422	0.408	0.429
90	2.2987	5.2838	-	9.30	9.20	0.435	0.423	0.424
80	2.0896	4.3664	-	9.20	9.10	0.434	0.414	0.418

(iv) PEO = 2.5 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	1.06	1.07	1.06	0.413	0.415	0.417
110	2.6628	7.0903	1.08	1.06	1.05	0.403	0.419	0.413
100	2.4902	6.2011	1.04	1.01	1.05	0.424	0.427	0.420
90	2.2987	5.2838	1.02	0.99	1.00	0.418	0.420	0.422
80	2.0896	4.3664	0.99	1.00	1.00	0.418	0.417	0.417

PEO (g/l)	D_{cm} x 10^8 (cm^2/s)	D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
1.0	6.82	5.70	38.87	0.39
1.5	8.07			
2.0	8.17			
2.5	8.98			

B2.4 PEO9 (quoted $M_w = 9.0x10^5$ g/mol)

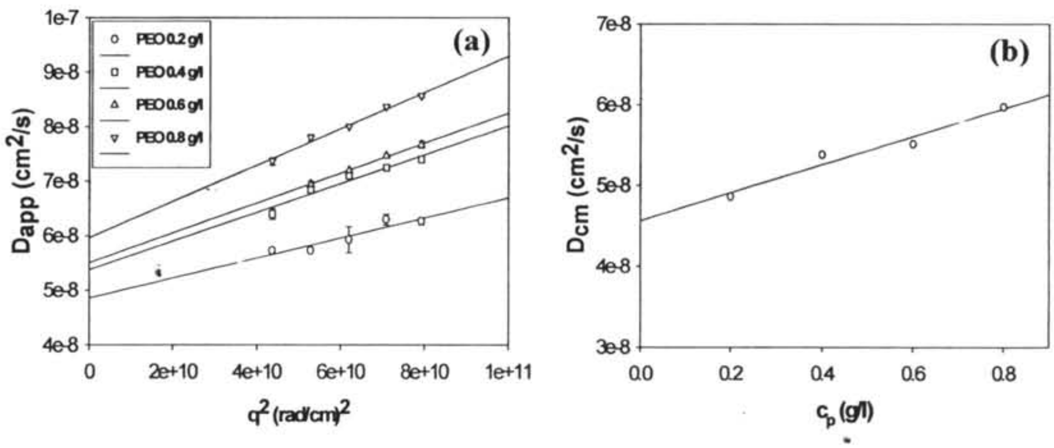


Figure 2.4 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different PEO concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of PEO concentration for PEO M_w 8.03x10^5 g/mol at 30°C.

(i) PEO = 0.2 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	6.20	6.20	6.40	0.448	0.445	0.439
110	2.6628	7.0903	6.20	6.50	6.200	0.426	0.40	0.434
100	2.4902	6.2011	6.40	5.80	5.60	0.401	0.455	0.424
90	2.2987	5.2838	5.70	5.80	5.70	0.424	0.429	0.438
80	2.0896	4.3664	5.40	5.20	5.20	0.427	0.437	0.449

(ii) PEO = 0.4 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	7.40	7.50	7.30	0.419	0.416	0.417
110	2.6628	7.0903	7.20	7.30	-	0.422	0.414	0.397
100	2.4902	6.2011	7.10	7.10	7.10	0.407	0.409	0.419
90	2.2987	5.2838	-	6.90	6.80	0.391	0.399	0.405
80	2.0896	4.3664	6.30	6.50	-	0.400	0.398	0.380

(iii) PEO = 0.6 g/l

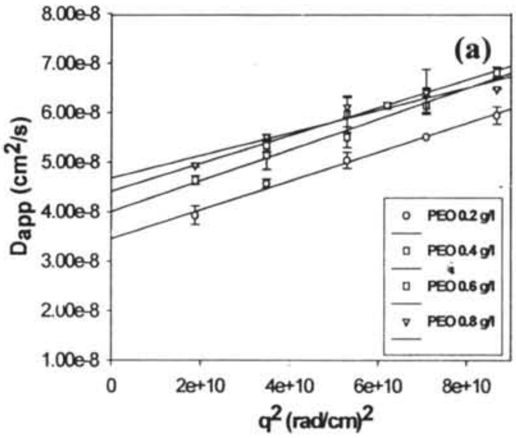
Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	7.60	7.80	7.60	0.425	0.410	0.419
110	2.6628	7.0903	7.50	7.40	7.50	0.408	0.420	0.420
100	2.4902	6.2011	7.20	-	7.20	0.412	0.421	0.416
90	2.2987	5.2838	6.90	-	7.00	0.412	0.424	0.414
80	2.0896	4.3664	-	-	-	0.430	0.422	0.427

(iv) PEO = 0.8 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
120	2.8151	7.9245	8.60	8.50	8.60	0.407	0.413	0.407
110	2.6628	7.0903	8.40	8.40	8.30	0.390	0.412	0.406
100	2.4902	6.2011	8.00	8.00	8.00	0.396	0.410	0.401
90	2.2987	5.2838	7.80	7.70	7.90	0.393	0.402	0.397
80	2.0896	4.3664	7.50	7.30	7.30	0.401	0.407	0.412

PEO (g/l)	D_{cm} x 10^8 (cm^2/s)	D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
0.2	4.86	4.60	48.56	0.37
0.4	5.38			
0.6	5.51			
0.8	5.97			

B2.5 PEO20 (quoted M_w = 40.0x10^5 g/mol)



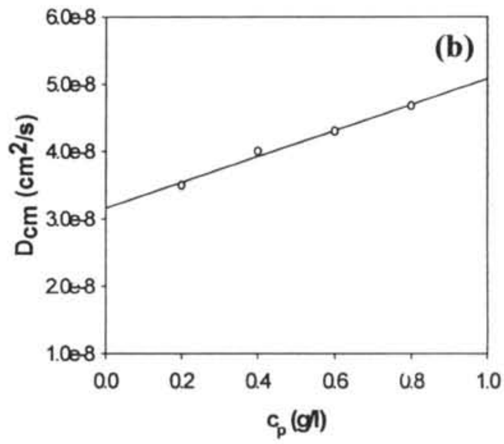


Figure 2.5 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different PEO concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of PEO concentration for PEO M_w 17.9x10^5 g/mol at 30°C.

(i) PEO = 0.2 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)				$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 4	Run 1	Run 2	Run 3
130	2.8946	8.6784	5.6	6.20	6.00	- -	0.987	0.912	0.922
110	2.6628	7.0903	-	5.50	5.50	-	0.827	0.813	0.834
90	2.2987	5.2838	-	4.70	5.20	5.20	0.839	0.801	0.796
70	1.8647	3.4769	4.40	4.60	4.70	-	0.654	0.665	0.671
50	1.3739	1.8877	3.90	4.40	3.50	3.90	0.667	0.660	0.604

(ii) PEO = 0.4 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.8946	8.6784	6.60	6.90	6.90	0.865	0.863	0.870
110	2.6628	7.0903	5.80	6.40	6.20	0.846	0.840	0.836
90	2.2987	5.2838	5.20	5.90	5.40	0.675	0.671	0.660
70	1.8647	3.4769	4.90	5.70	4.80	0.567	0.507	0.501
50	1.3739	1.8877	4.60	4.50	4.80	0.646	0.660	0.634

(iii) PEO = 0.6 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.8946	8.6784	6.60	6.80	7.00	0.691	0.673	0.697
110	2.6628	7.0903	7.20	6.40	5.70	0.691	0.674	0.659
90	2.2987	5.2838	6.00	6.20	6.20	0.613	0.620	0.615
70	1.8647	3.4769	6.70	5.60	5.60	0.675	0.669	0.680
50	1.3739	1.8877	5.40	5.50	5.10	0.625	0.626	0.628

(iv) PEO = 0.8 g/l

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
130	2.8946	8.6784	6.47	6.49	6.44	0.781	0.780	0.773
110	2.6628	7.0903	6.40	6.20	6.40	0.770	0.762	0.713
90	2.2987	5.2838	5.70	6.30	6.30	0.703	0.740	0.739
70	1.8647	3.4769	5.50	5.60	5.40	0.756	0.734	0.735
50	1.3739	1.8877	4.90	5.00	4.90	0.722	0.740	0.738

c_p (g/l)	D_{cm} x 10^8 (cm^2/s)	D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
0.2	3.50	3.20	70.24	0.32
0.4	4.00			
0.6	4.30			
0.8	4.68			

B3 Dynamic light scattering data for aqueous HTAC solutions at 30°C

B3.1 HTAC in aqueous solution

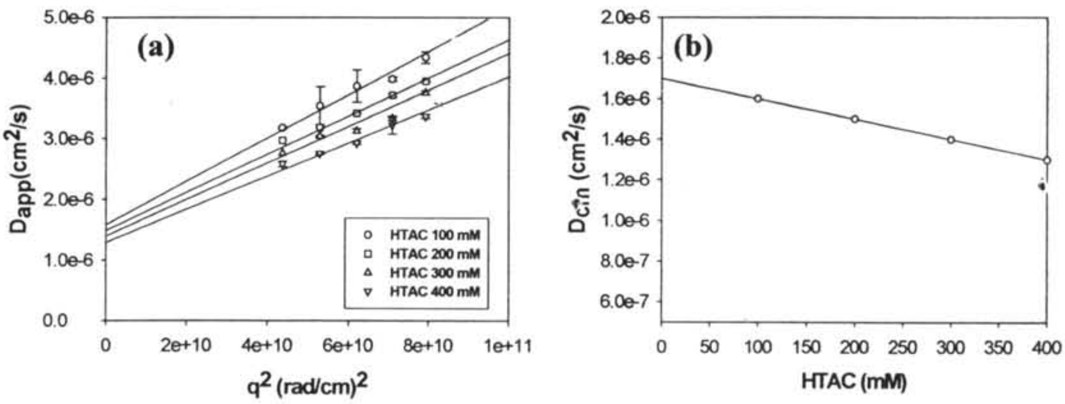


Figure 3.1 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of HTAC at 30°C.

(i) c_{HTAC} = 100 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^6 (cm^2/s)						$\frac{\mu_2}{\overline{\Gamma}^2}$		
			1	2	3	4	5	6	1	2	3
80	2.0896	4.3664	3.86	3.23	4.41	3.16	3.20	2.84	0.188	0.154	--
90	2.2987	5.2838	4.51	4.33	3.99	3.54	3.62	3.96	0.155	--	--
100	2.4902	6.2011	4.12	4.02	-	3.90	3.93	4.18	0.125	0.081	0.070
110	2.6628	7.0903	-	-	-	4.34	4.51	-	0.170	0.195	0.227

(ii) c_{HTAC} = 200 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^6 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.97	2.97	2.97	0.226	--	--
90	2.2987	5.2838	3.19	3.19	3.18	0.243	--	--
100	2.4902	6.2011	3.43	3.42	3.42	0.254	0.277	0.289
110	2.6628	7.0903	3.67	3.77	3.73	0.233	0.269	--
120	2.8151	7.9245	3.92	3.98	3.95	0.234	--	--

(iii) c_{HTAC} = 300 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^6 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.76	--	--	0.129	0.158	--
90	2.2987	5.2838	3.04	3.07	3.03	0.203	0.162	0.186
100	2.4902	6.2011	3.08	3.10	3.21	0.288	0.283	0.233
110	2.6628	7.0903	3.39	3.32	3.30	0.182	0.232	0.230
120	2.8151	7.9245	3.81	3.78	3.69	0.022	0.031	0.155

(iv) c_{HTAC} = 400 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^6 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.617	2.640	2.495	0.238	0.234	0.245
90	2.2987	5.2838	2.733	2.785	2.755	0.215	0.205	0.242
100	2.4902	6.2011	2.912	2.902	2.980	0.241	0.210	0.206
110	2.6628	7.0903	3.507	3.005	3.166	0.088	0.212	0.088
120	2.8151	7.9245	3.400	3.403	3.305	--	--	--

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	HTAC 1.3 mM		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
100	1.60	170.00	1.31	0.16
200	1.50			
300	1.40			
400	1.30			

B3.2 HTAC+ [NaSal]/[HTAC] = 1 in aqueous solution

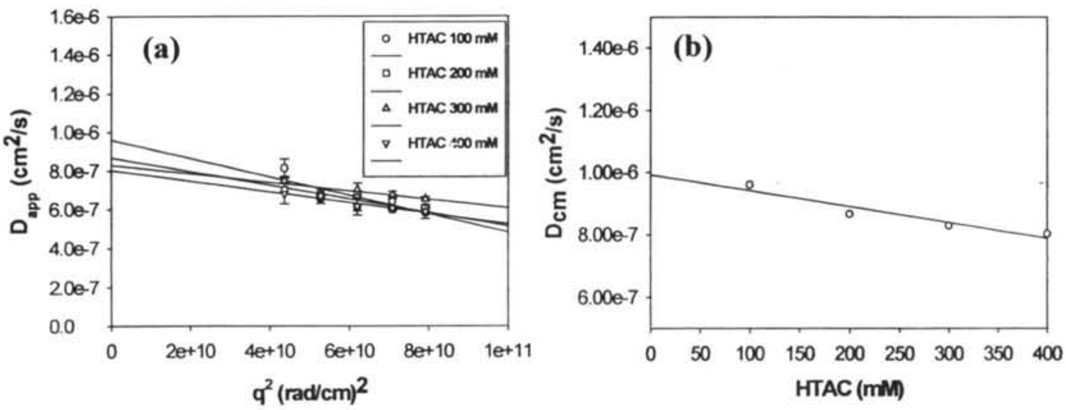


Figure 3.2 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of HTAC + [NaSal]/[HTAC] = 1 at 30°C.

(i) c_{HTAC} = 100 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	8.96	8.16	7.31	0.426	0.516	0.728
90	2.2987	5.2838	6.11	6.99	6.55	1.000	0.800	0.655
100	2.4902	6.2011	5.90	6.38	5.96	1.000	0.935	1.000
110	2.6628	7.0903	7.09	6.03	6.14	0.809	1.000	1.000
120	2.8151	7.9245	6.15	6.08	6.06	1.000	1.000	1.000

(ii) c_{HTAC} = 200 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	5.55	6.79	8.98	0.850	0.413	--
90	2.2987	5.2838	6.93	6.59	7.21	0.777	0.890	0.693
100	2.4902	6.2011	7.15	6.60	6.53	0.746	0.861	0.894
110	2.6628	7.0903	5.89	6.04	6.05	1.000	0.984	1.000
120	2.8151	7.9245	5.77	5.93	5.80	1.000	1.000	1.000

(iii) c_{HTAC} = 300 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\Gamma^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	7.66	7.22	7.61	-	-	-
90	2.2987	5.2838	6.56	6.49	7.39	0.735	0.781	0.538
100	2.4902	6.2011	6.78	6.71	7.68	1.000	1.000	1.000
110	2.6628	7.0903	7.18	6.80	7.14	0.884	0.987	0.896
120	2.8151	7.9245	6.37	6.78	6.45	1.000	1.000	1.000

(iv) c_{HTAC} = 400 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} $(rad/cm)^2$	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\Gamma^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	6.81	--	--	--	--	--
90	2.2987	5.2838	6.67	6.69	--	0.617	0.649	0.566
100	2.4902	6.2011	6.60	5.71	--	0.666	0.853	0.708
110	2.6628	7.0903	6.10	6.01	6.04	1.000	0.773	0.762
120	2.8151	7.9245	5.86	5.27	6.51	0.813	0.999	0.658

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	HTAC 0.7 mM		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\Gamma^2}$
100	9.61	99.8	2.23	0.17
200	8.67			
300	8.29			
400	8.03			

B3.3 HTAC+ [NaSal]/[HTAC] = 5 in aqueous solution

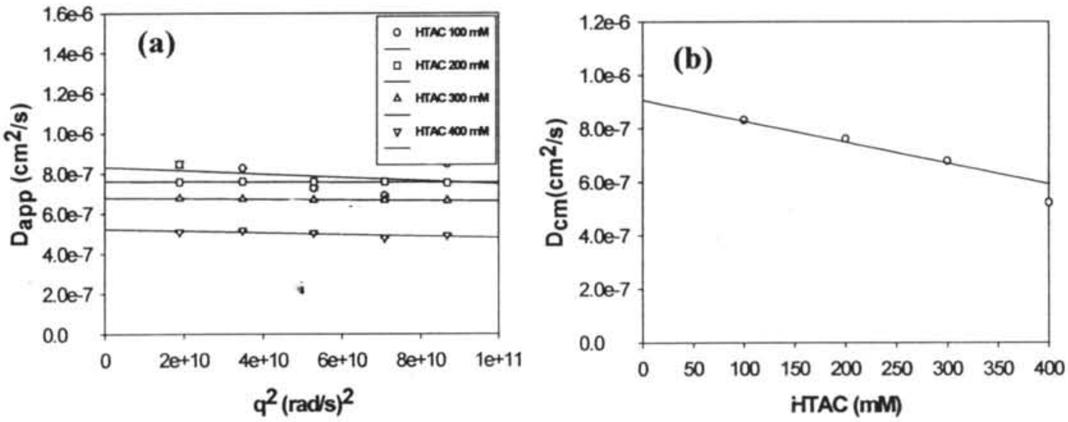


Figure 3.3 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of HTAC + [NaSal]/[HTAC] = 5 at 30°C.

(i) c_{HTAC} = 100 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	8.62	8.15	8.63	0.032	0.111	0.064
70	1.8646	3.4769	8.28	8.22	8.34	0.084	0.087	0.037
90	2.2987	5.2838	7.10	7.39	7.34	0.183	0.182	0.180
110	2.6628	7.0903	6.86	6.77	7.03	0.192	0.169	--
130	2.9459	8.6784	8.53	8.44	8.47	0.175	--	--

(ii) c_{HTAC} = 200 mM

Angie (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	7.57	7.57	7.59	0.180	0.201	0.186
70	1.8646	3.4769	7.59	7.61	7.64	0.205	0.198	0.185
90	2.2987	5.2838	7.60	7.61	7.58	0.183	0.168	0.190
110	2.6628	7.0903	7.59	7.59	7.61	0.162	0.177	0.170
130	2.9459	8.6784	7.53	7.57	7.51	0.172	0.128	0.173

(iii) c_{HTAC} = 300 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	6.74	6.75	6.80	0.108	0.103	0.100
70	1.8646	3.4769	6.75	6.68	6.76	0.112	0.112	0.090
90	2.2987	5.2838	6.72	6.69	6.68	0.115	0.075	0.103
110	2.6628	7.0903	6.70	6.65	6.65	0.117	0.142	0.114
130	2.9459	8.6784	6.66	6.63	6.64	0.097	0.099	0.110

(iv) c_{HTAC} = 400 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	5.11	5.08	5.07	0.080	0.103	0.102
70	1.8646	3.4769	5.16	5.20	5.15	0.073	0.053	0.103
90	2.2987	5.2838	4.95	5.17	4.98	0.063	0.060	0.065
110	2.6628	7.0903	4.81	4.78	4.75	0.034	0.019	0.016
130	2.9459	8.6784	4.85	5.00	4.89	0.085	0.032	0.081

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	HTAC 0.6 mM		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
100	8.32	90.7	2.45	0.17
200	7.61			
300	6.79			
400	5.23			

B4 Dynamic light scattering data for aqueous PEO - HTAC solutions at 30°C

B4.1 PEO6_40 + HTAC in aqueous solution

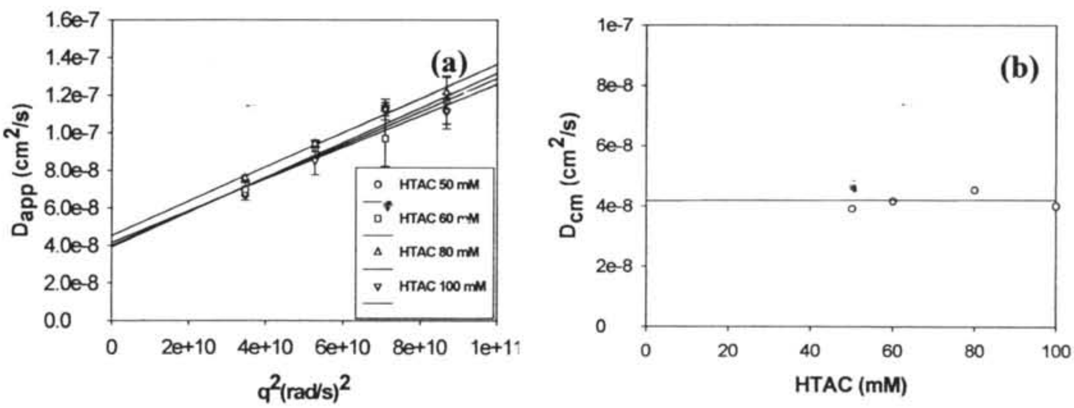


Figure 4.1 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of PEO6_40 + HTAC at 30°C.

(i) c_{HTAC} = 50 mM

Angle (degree)	$q \times 10^{-5}$ (rad/cm)	$q^2 \times 10^{-10}$ (rad/cm)^2	$D_{app} \times 10^7$ (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
70	1.8646	3.4769	0.65	0.63	0.72	0.812	0.863	0.823
90	2.2987	5.2838	0.88	0.92	0.97	0.840	0.888	0.892
110	2.6628	7.0903	1.16	1.09	--	0.854	0.876	0.881
130	2.9459	8.6784	1.21	1.02e	--	0.842	0.832	0.868

(ii) c_{HTAC} = 60 mM

Angle (degree)	$q \times 10^{-5}$ (rad/cm)	$q^2 \times 10^{-10}$ (rad/cm)^2	$D_{app} \times 10^7$ (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
70	1.8646	3.4769	0.77	0.63	0.72	0.821	0.811	0.886
90	2.2987	5.2838	0.98	0.92	0.97	0.889	0.850	0.837
110	2.6628	7.0903	0.70	1.09	--	0.845	0.859	--
130	2.9459	8.6784	1.39	1.02	--	0.871	0.826	0.840

(iii) c_{HTAC} = 80 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
70	1.8646	3.4769	0.76	0.72	0.80	0.861	0.829	--
90	2.2987	5.2838	0.91	0.98	0.93	0.857	--	--
110	2.6628	7.0903	1.13	1.14	1.15	0.822	0.823	0.822
130	2.9459	8.6784	1.33	1.04	1.27	0.839	--	--

(iv) c_{HTAC} = 100 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$
			Run 1	Run 2	Run 3	
70	1.8646	3.4769	0.67	--	--	0.834
90	2.2987	5.2838	0.83	0.71	0.80	0.872
110	2.6628	7.0903	1.22	1.12	1.03	0.815
130	2.9459	8.6784	1.18	1.18	0.98	0.835

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	PEO60_40+HTAC 5 mM		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
50	3.90	3.98	55.9	0.83
60	4.15			
80	4.53			
100	3.99			

B4.2 PEO6_40 + [NaSal]/[HTAC] = 1 in aqueous solution

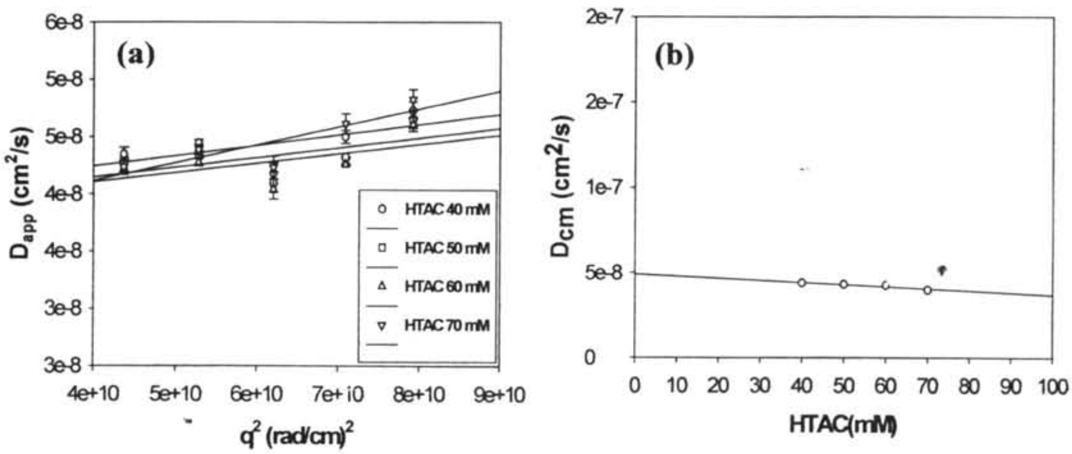


Figure 4.2 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of PEO6_40 + [NaSal]/[HTAC] = 1 at 30°C.

(i) c_{HTAC} = 40 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$			
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3	Run 4
80	2.0896	4.3664	4.96	4.76	4.82	0.149	--	--	--
90	2.2987	5.2838	4.99	4.89	4.95	0.153	0.139	0.180	0.120
100	2.4902	6.2011	4.85	4.55	4.65	0.101	--	--	--
110	2.6628	7.0903	5.00	4.90	5.10	0.319	0.053	0.310	0.102
120	2.8151	7.9245	5.11	5.21	5.37	0.226	--	--	--

(ii) c_{HTAC} = 50 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$			
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3	Run 4
80	2.0896	4.3664	4.88	4.68	4.70	0.149	--	--	--
90	2.2987	5.2838	4.91	4.81	4.80	0.143	--	--	--
100	2.4902	6.2011	4.77	4.47	4.57	0.103	--	--	--
110	2.6628	7.0903	4.82	4.81	4.83	0.131	0.141	0.149	0.085
120	2.8151	7.9245	5.03	5.13	5.29	0.125	--	--	--

(iii) c_{HTAC} = 60 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$	
			Run 1	Run 2	Run 3	Run 1	Run 2
80	2.0896	4.3664	4.82	4.62	4.74	0.222	0.248
90	2.2987	5.2838	4.85	4.75	4.74	0.190	0.285
100	2.4902	6.2011	4.71	4.41	4.51	0.219	--
110	2.6628	7.0903	4.76	4.75	4.77	0.216	0.293
120	2.8151	7.9245	5.03	5.07	5.23	0.294	0.290

(iv) c_{HTAC} = 60 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$	
			Run 1	Run 2	Run 3	Run 1	Run 2
80	2.0896	4.3664	4.74	4.84	4.62	0.280	--
90	2.2987	5.2838	4.87	4.97	4.82	0.150	0.251
100	2.4902	6.2011	4.93	4.63	4.63	0.200	0.203
110	2.6628	7.0903	5.08	4.98	5.28	0.300	0.357
120	2.8151	7.9245	5.19	5.29	5.49	0.270	0.219

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	PEO60_40+HTAC 5 mM + [NaSal]/[HTAC] = 1		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
40	4.40	4.92	45.1	0.21
50	4.32			
60	4.2			
70	4.00			

B4.3 PEO6_40 + [NaSal]/[HTAC] = 5 in aqueous solution

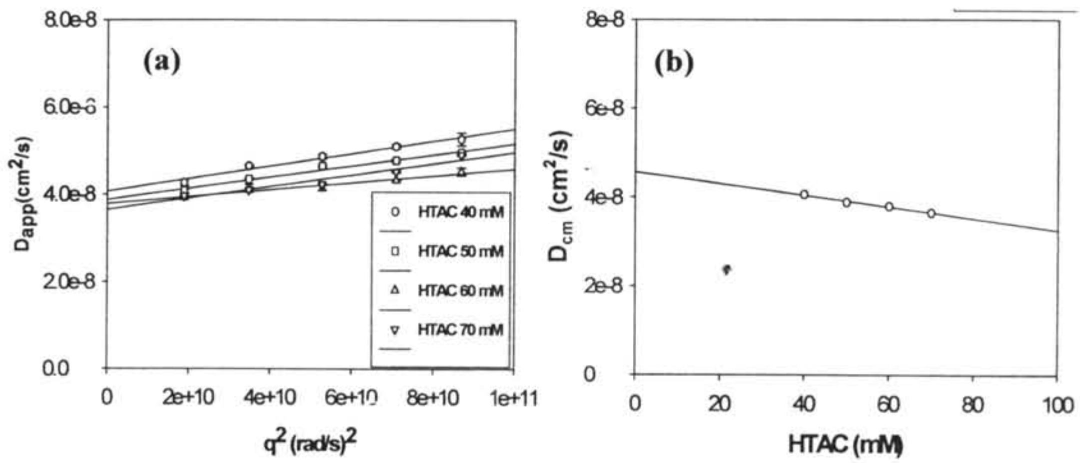


Figure 4.3 (a) Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of PEO6_40 + [NaSal]/[HTAC] = 5 at 30°C.

(i) c_{HTAC} = 40 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	4.41	4.21	4.18	0.312	0.315	0.322
70	1.8646	3.4769	4.67	4.61	4.68	0.324	0.334	0.327
90	2.2987	5.2838	4.87	4.77	4.97	0.341	0.337	0.347
110	2.6628	7.0903	5.15	5.05	--	0.365	0.364	0.361
130	2.9459	8.6784	5.42	5.12	--	0.385	0.381	0.388

(ii) c_{HTAC} = 50 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	4.13	4.10	4.00	0.331	0.333	0.337
70	1.8646	3.4769	4.34	4.32	4.39	0.337	0.416	0.344
90	2.2987	5.2838	4.65	4.61	4.69	0.352	0.398	0.322
110	2.6628	7.0903	4.78	4.71	4.85	0.461	0.432	0.449
130	2.9459	8.6784	5.01	4.91	4.97	0.400	0.422	0.432

(iii) c_{HTAC} = 60 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	3.87	3.92	3.99	0.387	0.337	0.346
70	1.8646	3.4769	3.99	4.19	4.26	0.379	0.341	0.350
90	2.2987	5.2838	4.14	4.24	4.04	0.390	0.350	0.341
110	2.6628	7.0903	4.34	4.33	4.32	0.421	0.411	0.434
130	2.9459	8.6784	4.56	4.66	4.36	0.465	0.425	0.423

(iv) c_{HTAC} = 70 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
50	1.3739	1.8877	3.89	3.94	4.05	0.410	0.368	0.379
70	1.8646	3.4769	4.00	4.11	4.19	0.341	0.334	0.333
90	2.2987	5.2838	4.25	4.21	--	0.415	0.481	0.438
110	2.6628	7.0903	4.54	4.50	--	0.450	0.436	0.465
130	2.9459	8.6784	4.92	4.90	--	0.500	0.422	0.412

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	PEO60_40+HTAC 5 mM + [NaSal]/[HTAC] = 5		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
40	4.06	4.59	48.4	0.23
50	3.89			
60	3.79			
70	3.65			

B4.4 PEO20_15 + HTAC in aqueous solution

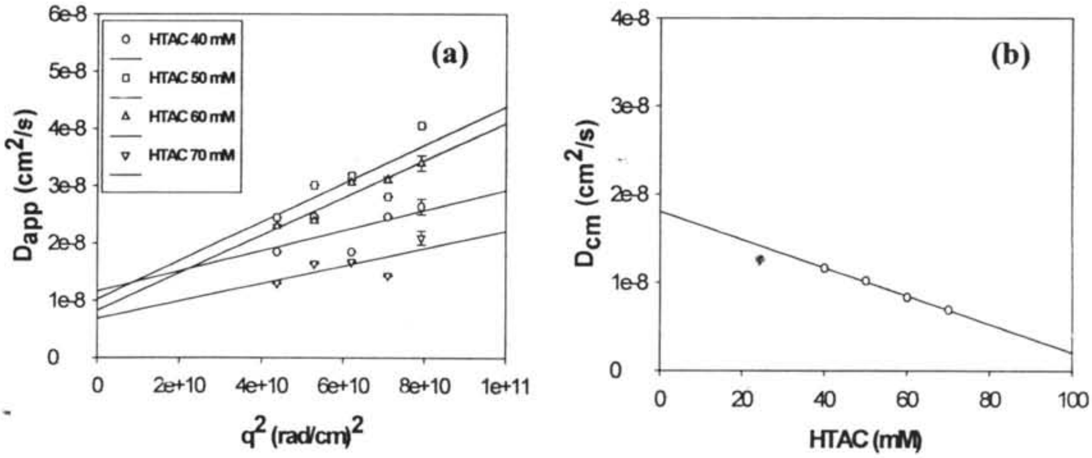


Figure 4.4 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of PEO20_15 + HTAC at 30°C.

(i) c_{HTAC} = 40 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	1.84	1.86	1.84	0.835	0.809	0.742
90	2.2987	5.2838	2.49	2.46	2.43	0.779	0.782	0.796
100	2.4902	6.2011	2.63	2.40	2.88	0.700	0.841	0.750
110	2.6628	7.0903	3.20	3.13	3.01	0.676	0.710	0.790
120	2.8151	7.9245	3.19	3.09	3.02	0.659	0.731	0.711

(ii) c_{HTAC} = 50 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.44	2.47	2.43	0.812	0.765	0.780
90	2.2987	5.2838	3.02	3.00	3.02	0.796	0.730	0.791
100	2.4902	6.2011	3.15	3.24	3.13	0.728	0.723	0.706
110	2.6628	7.0903	2.79	2.81	2.83	0.677	0.679	0.687
120	2.8151	7.9245	4.04	4.03	4.11	0.619	0.645	0.606

(iii) c_{HTAC} = 60 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.34	2.26	2.30	0.913	0.942	0.955
90	2.2987	5.2838	2.37	2.36	2.43	0.908	0.907	0.989
100	2.4902	6.2011	3.00	3.05	3.12	0.932	0.908	0.915
110	2.6628	7.0903	3.03	3.21	3.08	0.962	0.911	0.935
120	2.8151	7.9245	3.14	3.45	3.60	0.939	0.917	0.958

(iv) c_{HTAC} = 70 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	1.29	1.29	1.32	0.963	0.930	0.920
90	2.2987	5.2838	1.64	1.63	1.67	0.944	0.957	0.952
100	2.4902	6.2011	1.66	1.67	1.69	0.902	0.983	0.978
110	2.6628	7.0903	1.42	1.43	1.46	0.904	0.878	0.910
120	2.8151	7.9245	1.97	1.97	2.33	0.949	0.848	0.927

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	PEO20_15+HTAC 5 mM		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
40	1.16	2.40	92.7	0.61
50	1.02			
60	8.32			
70	6.90			

B4.5 PEO20_15 + [NaSal]/[HTAC] = 1 in aqueous solution

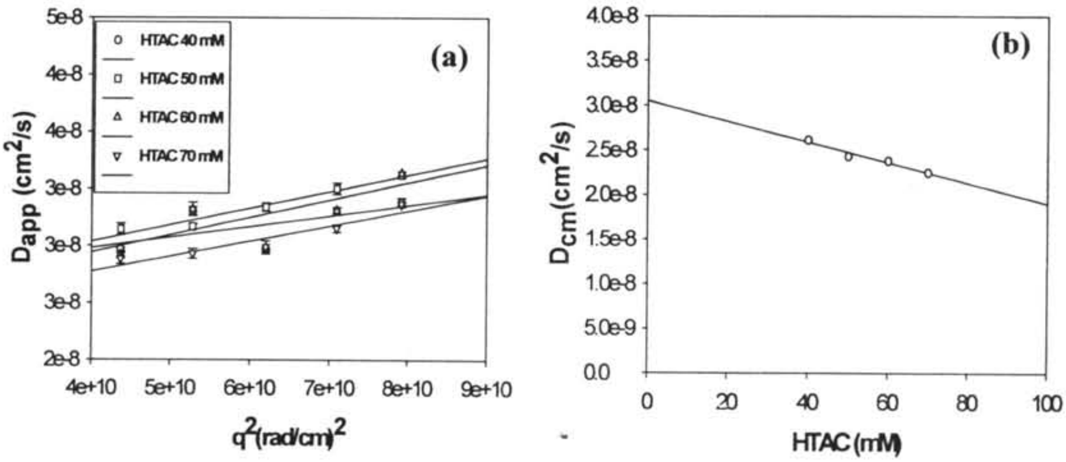


Figure 4.5 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of PEO20_15 + [NaSal]/[HTAC] = 1 at 30°C.

(i) c_{HTAC} = 40 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.99	2.96	2.94	0.317	0.312	0.322
90	2.2987	5.2838	3.28	3.38	3.26	0.333	0.342	0.322
100	2.4902	6.2011	3.33	3.46	3.36	0.361	0.338	0.318
110	2.6628	7.0903	3.66	3.56	3.69	0.288	0.294	0.342
120	2.8151	7.9245	3.96	3.91	3.82	0.386	0.335	0.335

(ii) c_{HTAC} = 50 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	3.07	3.24	3.12	0.389	0.333	0.329
90	2.2987	5.2838	3.18	3.19	3.12	0.365	0.341	0.367
100	2.4902	6.2011	3.32	3.41	3.29	0.356	0.359	0.369
110	2.6628	7.0903	3.52	3.41	3.58	0.354	0.415	0.400
120	2.8151	7.9245	3.62	3.68	3.58	0.370	0.433	0.411

(iii) c_{HTAC} = 60 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.86	2.93	2.97	0.399	0.369	0.363
90	2.2987	5.2838	3.21	3.34	3.41	0.444	0.476	0.460
100	2.4902	6.2011	2.98	--	--	0.450	0.489	0.436
110	2.6628	7.0903	3.31	--	--	0.440	0.434	0.527
120	2.8151	7.9245	3.64	--	--	0.480	0.405	0.400

(iv) c_{HTAC} = 70 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^8 (cm^2/s)			$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
80	2.0896	4.3664	2.97	2.87	2.81	0.356	0.354	0.333
90	2.2987	5.2838	3.01	2.92	2.86	0.363	0.370	0.347
100	2.4902	6.2011	3.09	2.98	2.89	0.376	0.375	0.356
110	2.6628	7.0903	3.12	3.22	3.12	0.389	0.355	0.385
120	2.8151	7.9245	3.35	3.39	3.37	0.360	0.395	0.376

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	PEO20_15+HTAC 5 mM + [NaSal]/[HTAC] = 1		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
40	2.61	3.08	72.2	0.25
50	2.43			
60	2.38			
70	2.25			

B4.6 PEO20_15 + [NaSal]/[HTAC] = 5 in aqueous solution

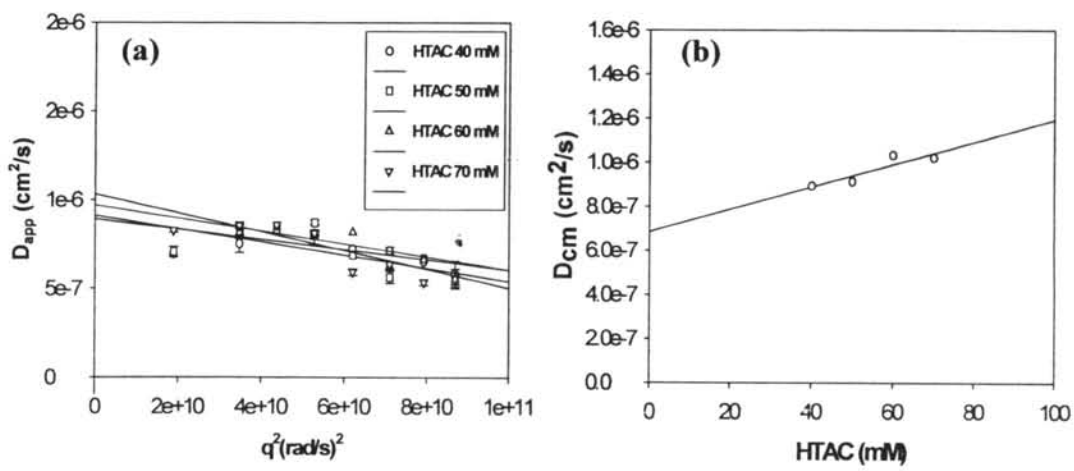


Figure 4.6 **(a)** Apparent diffusion coefficient, D_{app} as a function of square of scattering wave vector, q^2 at different HTAC concentrations and **(b)** Center of mass diffusion coefficient, D_{cm} as a function of HTAC concentration for aqueous solution of PEO20_15 + [NaSal]/[HTAC] = 5 HTAC at 30°C.

(i) c_{HTAC} = 40 mM

Angle (degree)	$q \times 10^{-5}$ (rad/cm)	$q^2 \times 10^{-10}$ (rad/cm)^2	$D_{app} \times 10^7$ (cm^2/s)				$\frac{\mu_2}{\Gamma^2}$		
			Run 1	Run 2	Run 3	Run 4	Run 1	Run 2	Run 3
50	1.3739	1.8877	6.93	--	--	--	0.539	0.553	0.546
70	1.8646	3.4769	7.00	7.08	8.50	--	0.296	0.284	0.286
80	2.0896	4.3664	8.28	--	--	--	0.158	--	--
90	2.2987	5.2838	8.05	8.22	8.29	7.91	0.019	0.069	0.076
100	2.4902	6.2011	7.23	--	--	--	0.357	--	--
110	2.6628	7.0903	7.17	6.89	7.73	6.82	0.286	0.336	0.202
120	2.8151	7.9245	6.53	--	--	--	0.512	--	--
130	2.9459	8.6784	7.56	4.03	6.03	5.77	0.176	0.400	0.509

(ii) c_{HTAC} = 50 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)				$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 4	Run 1	Run 2	Run 3
50	1.3739	1.8877	6.97	7.63	6.62	--	0.316	0.239	0.327
70	1.8646	3.4769	8.12	8.38	8.73	7.41	0.237	--	--
80	2.0896	4.3664	8.54	--	--	--	0.247	--	--
90	2.2987	5.2838	8.59	9.09	8.64	8.59	0.307	--	--
100	2.4902	6.2011	6.90	--	--	--	0.328	--	--
110	2.6628	7.0903	4.80	5.54	5.75	6.45	0.434	--	--
120	2.8151	7.9245	6.70	--	--	--	0.429	--	--
130	2.9459	8.6784	5.10	5.49	5.19	6.22	0.408	--	--

(iii) c_{HTAC} = 60 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)				$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 4	Run 1	Run 2	Run 3
70	1.8646	3.4769	8.58	8.61	8.53	7.01	0.281	--	--
90	2.2987	5.2838	8.14	8.69	8.10	6.72	0.334	--	--
100	2.4902	6.2011	8.18	--	--	--	0.263	--	--
110	2.6628	7.0903	6.60	6.16	5.67	6.72	0.421	0.511	0.634
120	2.8151	7.9245	6.65	--	--	--	0.406	--	--
130	2.9459	8.6784	6.86	4.95	6.09	4.36	0.365	0.523	--

(iv) c_{HTAC} = 70 mM

Angle (degree)	q x 10^{-5} (rad/cm)	q^2 x 10^{-10} (rad/cm)^2	D_{app} x 10^7 (cm^2/s)				$\frac{\mu_2}{\overline{\Gamma}^2}$		
			Run 1	Run 2	Run 3	Run 4	Run 1	Run 2	Run 3
50	1.3739	1.8877	8.18	8.15	8.51	--	0.160	0.158	0.179
70	1.8646	3.4769	8.75	8.75	8.74	7.95	0.208	--	--
80	2.0896	4.3664	8.58	--	--	--	0.218	--	--
90	2.2987	5.2838	8.45	8.01	7.62	8.38	0.238	--	--
100	2.4902	6.2011	5.82	5.60	5.65	5.95	0.338	--	--
110	2.6628	7.0903	6.37	--	--	--	0.473	--	--
120	2.8151	7.9245	5.02	5.40	5.82	5.18	0.514	--	--

HTAC (mM)	D_{cm} x 10^8 (cm^2/s)	PEO20_15+HTAC 5 mM + [NaSal]/[HTAC] = 5		
		D_o x 10^{12} (m^2/s)	R_h (nm)	$\frac{\mu_2}{\overline{\Gamma}^2}$
40	0.89	2.90	76.4	0.22
50	0.91			
60	1.03			
70	1.02			

Appendix C Surface tension and Conductivity Data for Aqueous HTAC and PEO-HTAC and PEO-HTAC-NaSal solutions at 30°C

C1 Data from surface tension measurement at 30°C

(C1.1) HTAC in aqueous solution

HTAC (mM)	γ (mN/m)			
	Run 1	Run 2	Run 3	Run 4
0.01	49.90	50.70	50.30	51.80
0.02	49.20	48.70	-	-
0.04	47.90	47.20	-	-
0.06	45.50	46.00	-	-
0.08	44.50	44.90	-	-
0.10	43.40	42.50	-	-
0.20	39.40	38.90	-	-
0.40	36.60	36.40	-	-
0.60	35.30	35.10	-	-
0.80	34.80	34.60	-	-
1.00	34.00	34.20	35.00	34.90
1.20	32.90	32.80	-	-
1.40	32.10	32.20	-	-
2.00	32.50	32.40	-	-
3.00	32.30	33.00	-	-
4.00	32.50	32.90	-	-
5.00	32.90	31.00	-	-

(C1.2) PEO1_40+ HTAC in aqueous solution

HTAC (mM)	γ (mN/m)	
	Run 1	Run 2
0.00	57.00	57.10
0.01	47.60	47.70
0.03	44.60	44.50
0.05	40.40	40.30
0.10	37.50	37.40
0.15	36.10	36.30
0.20	35.20	35.10
0.25	35.20	35.10
0.30	35.10	35.00
0.40	35.30	35.30
0.50	32.20	32.10
0.60	30.80	30.60
0.70	29.40	29.30
0.80	28.70	28.80
0.90	28.60	28.50
1.00	28.50	28.40
1.70	28.80	28.80
5.00	28.60	28.50

(C1.3) PEO1_200 + HTAC in aqueous solution

HTAC (mM)	γ (mN/m)	
	Run 1	Run 2
0.00	53.20	53.00
0.01	48.00	47.80
0.05	42.90	42.80
0.10	37.60	37.50
0.15	36.20	36.10
0.20	35.60	35.70
0.30	35.50	35.40
0.40	35.10	35.00
0.50	33.60	33.70
0.60	31.70	31.00
0.70	29.90	29.80
0.80	29.70	29.70
0.90	29.00	28.90
1.00	29.10	29.00
2.00	30.10	30.00
3.00	30.60	30.50
5.00	30.30	30.30

(C1.4) PEO6_40 + HTAC in aqueous solution

HTAC (mM)	γ (mN/m)				
	Run 1	Run 2	Run 3	Run 4	Run 5
0.00	63.06	63.07	63.09	63.04	62.93
0.02	62.15	62.20	62.15	62.08	62.17
0.05	61.36	61.23	60.99	60.94	60.94
0.10	58.62	58.39	58.17	58.03	58.85
0.12	59.13	59.05	59.00	58.96	58.87
0.15	58.93	58.81	59.66	59.60	--
0.18	59.93	59.81	59.66	60.60	--
0.20	60.11	59.98	59.89	59.78	59.69
0.30	58.56	58.32	58.22	58.09	58.48
0.40	57.26	57.06	56.92	56.79	56.70
0.50	56.88	56.11	55.96	55.76	55.61
0.60	55.29	55.70	54.90	54.54	54.43
0.70	53.99	53.39	54.43	54.31	54.14
0.80	53.00	52.86	52.72	52.44	52.25
0.90	51.06	50.85	50.67	50.57	50.44
1.00	50.33	49.81	49.63	49.18	48.98
1.50	45.60	45.32	45.10	45.06	45.55
1.80	42.36	42.79	42.62	42.25	42.07
2.00	42.34	42.88	42.59	42.28	42.10
3.00	41.87	41.97	41.69	42.45	42.18
4.00	42.03	41.88	41.73	41.59	41.50
5.00	40.48	40.35	40.44	40.27	40.34

(C1.5) PEO6_40 + HTAC + [NaSal]/[HTAC] = 1 in aqueous solution

HTAC (mM)	γ (mN/m)				
	Run 1	Run 2	Run 3	Run 4	Run 5
0.00	63.17	62.97	63.36	62.99	62.89
0.02	61.56	61.41	61.29	61.19	61.84
0.05	61.04	61.21	60.86	60.48	60.77
0.10	58.95	58.78	58.66	58.92	58.84
0.12	58.94	58.76	59.19	58.88	59.36
0.15	56.97	56.22	55.94	57.01	56.36
0.20	56.68	56.59	55.79	56.09	57.14
0.30	56.07	56.48	56.42	56.24	56.98
0.40	54.42	54.59	55.72	54.32	54.66
0.50	53.72	53.63	54.07	53.78	52.79
0.60	52.23	52.01	51.68	51.66	52.40
0.70	51.12	51.80	51.06	51.49	50.94
0.80	49.62	50.52	49.37	50.15	49.47
0.90	47.92	47.36	48.49	48.48	47.31
1.00	44.92	45.05	44.89	45.03	44.33
1.50	41.68	41.42	41.12	41.54	41.19
2.00	42.01	41.69	41.92	41.60	41.92
3.00	41.27	41.38	41.50	41.06	40.94
4.00	41.12	41.54	41.29	41.18	41.44
5.00	39.95	40.01	40.21	40.03	40.03

(C1.6) PEO6_40 + HTAC + [NaSal]/[HTAC] = 5 in aqueous solution

HTAC (mM)	γ (mN/m)				
	Run 1	Run 2	Run 3	Run 4	Run 5
0.00	63.17	62.97	63.36	62.99	62.89
0.02	60.59	60.69	60.82	60.64	61.02
0.05	60.02	60.21	60.33	60.47	59.99
0.10	58.44	58.57	59.20	58.68	59.24
0.12	58.57	58.19	57.92	57.76	57.50
0.15	55.48	55.31	56.14	55.51	55.28
0.20	55.98	55.97	55.67	55.95	55.95
0.30	55.63	55.92	55.16	55.50	55.79
0.40	52.63	52.17	51.68	51.97	51.48
0.50	51.30	50.68	51.16	51.60	51.55
0.60	48.64	49.11	48.60	48.73	49.05
0.70	44.76	44.44	44.11	44.74	44.38
0.80	42.49	42.86	42.85	42.63	42.30
0.90	41.95	41.59	41.03	41.77	41.32
1.00	40.82	40.40	40.68	40.19	40.94
1.50	40.01	40.00	40.30	40.05	40.09
2.00	39.62	39.37	39.68	40.09	39.45
3.00	39.14	39.63	39.03	39.88	39.73
4.00	38.47	38.63	38.40	38.36	38.51
5.00	38.48	38.21	38.50	38.32	38.13

(C1.7) PEO6_200 + HTAC in aqueous solution

HTAC (mM)	γ (mN/m)				
	Run 1	Run 2	Run 3	Run 4	Run 5
0.00	64.06	64.47	64.26	65.06	64.42
0.02	62.47	62.50	62.99	62.26	62.86
0.05	61.59	61.46	61.36	61.32	61.21
0.10	60.87	60.18	60.69	59.30	60.39
0.12	59.83	59.61	59.26	59.11	59.04
0.15	58.23	58.21	58.26	58.31	58.24
0.18	57.46	57.41	57.36	57.32	57.25
0.20	57.39	57.26	57.21	57.16	57.09
0.30	56.83	56.51	56.32	56.07	56.05
0.40	55.92	55.81	55.71	55.66	55.55
0.50	54.68	54.94	54.64	54.47	54.39
0.60	54.98	54.75	54.64	54.43	54.32
0.70	53.19	53.12	53.09	53.01	52.84
0.80	53.21	52.96	52.80	52.60	52.54
0.90	50.51	50.69	50.82	51.01	50.91
1.00	50.45	50.21	50.08	49.89	49.66
1.50	44.75	44.55	44.35	44.11	43.77
1.80	41.54	41.03	40.76	40.97	40.34
2.00	41.33	41.13	40.96	40.77	40.35
3.00	40.77	40.86	40.74	40.57	40.30
4.00	40.78	40.59	40.49	40.36	40.28
5.00	40.07	40.05	40.01	40.00	40.00

(C1.8) PEO20_15 + HTAC in aqueous solution

HTAC (mM)	γ (mN/m)	
	Run 1	Run 2
0.00	55.40	55.40
0.01	53.40	53.40
0.05	45.70	45.60
0.10	42.50	42.40
0.15	41.30	41.20
0.20	40.50	40.60
0.30	40.40	40.00
0.40	39.90	39.70
0.50	38.50	38.20
0.60	37.00	36.90
0.70	35.60	35.40
0.80	34.90	34.70
0.90	34.00	34.90
1.00	33.70	33.60
1.50	32.20	32.10
2.00	31.50	31.40
3.00	31.90	32.00
4.00	32.40	32.50
5.00	32.50	32.50

(C1.9) PEO20_15 + HTAC + [NaSal]/[HTAC] = 1 in aqueous solution

HTAC (mM)	γ (mN/m)				
	Run 1	Run 2	Run 3	Run 4	Run 5
0.00	64.75	63.12	64.17	63.83	63.73
0.02	60.82	60.18	61.04	60.90	60.68
0.05	60.46	59.78	60.02	60.29	59.99
0.10	58.26	58.26	58.28	58.12	58.09
0.12	57.59	57.84	58.14	58.33	58.64
0.15	58.00	58.62	58.25	57.77	57.97
0.20	57.59	58.30	58.34	57.96	58.47
0.30	55.02	55.84	55.19	55.14	55.09
0.40	53.38	53.49	53.60	53.80	54.27
0.50	52.90	52.81	52.81	52.81	52.81
0.60	51.42	51.81	51.48	51.80	52.23
0.70	48.38	48.29	48.24	48.91	47.85
0.80	47.33	46.99	48.00	47.58	47.31
0.90	44.56	44.79	45.22	44.35	44.95
1.00	43.72	43.87	43.00	43.28	42.93
1.50	40.34	40.13	40.84	39.45	39.31
2.00	39.03	39.34	39.18	38.94	38.41
3.00	38.82	38.79	39.60	38.58	39.36
4.00	37.53	37.96	37.45	38.41	38.25
5.00	38.22	38.37	38.19	38.63	38.57

(C1.10) PEO20_15 + HTAC + [NaSal]/[HTAC] = 5 in aqueous solution

HTAC (mM)	γ (mN/m)				
	Run 1	Run 2	Run 3	Run 4	Run 5
0.00	63.75	64.12	64.17	63.83	64.73
0.02	60.91	60.63	60.49	60.38	60.01
0.05	59.18	59.99	59.80	59.62	59.50
0.10	58.45	58.45	56.04	58.56	56.46
0.12	58.03	57.83	57.55	57.20	56.77
0.15	57.26	58.04	57.79	57.62	57.42
0.20	57.24	57.14	57.07	57.78	57.25
0.30	52.72	52.59	53.36	53.84	50.56
0.40	49.98	46.69	49.47	49.27	48.90
0.50	47.70	46.46	47.68	47.56	47.98
0.60	46.35	46.05	45.76	45.48	45.71
0.70	44.93	44.68	44.85	44.26	44.23
0.80	42.72	42.43	42.22	43.10	42.77
0.90	39.88	39.47	39.94	40.06	40.35
1.00	40.30	40.60	40.98	40.75	40.03
1.50	41.45	41.17	40.99	40.76	40.61
2.00	40.68	40.30	40.75	40.30	40.21
3.00	38.69	38.85	38.49	39.25	38.07
4.00	38.17	38.33	37.42	38.45	37.96
5.00	38.07	37.97	37.81	37.69	37.65

(C1.11) PEO20_200 + HTAC in aqueous solution

HTAC (mM)	γ (mN/m)	
	Run 1	Run 2
0.00	55.30	55.60
0.01	54.40	--
0.05	47.50	47.50
0.10	43.80	43.80
0.20	40.40	40.30
0.30	40.60	40.50
0.40	40.10	40.00
0.50	40.40	40.40
0.60	39.80	39.70
0.70	39.90	39.80
0.80	38.10	38.00
0.90	37.40	37.30
1.00	35.00	35.10
2.00	34.20	34.10
3.00	35.20	35.10
5.00	35.20	35.10

C2 Data from conductivity measurement at 30°C

(C2.1) HTAC in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	Run 1	Run 2
0.10	13.50	13.70
0.20	22.20	22.50
0.30	30.20	30.50
0.40	34.90	35.00
0.60	58.20	58.50
0.80	73.30	73.50
1.00	93.30	93.70
1.30	115.60	116.00
1.50	122.60	124.80
2.00	146.40	145.40
2.50	153.00	154.40
3.00	178.10	179.00
4.00	205.90	206.90
5.00	238.00	240.00

(C2.2) HTAC + NaSal in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	[NaSal/[HTAC] = 1	[NaSal/[HTAC] = 5
0.00	10.87	10.87
0.10	175.20	797.00
0.20	331.00	1436.00
0.30	472.00	2070.00
0.50	762.00	3350.00
0.70	1049.00	4380.00
0.90	1312.00	5870.00
1.00	1451.00	6430.00
2.00	2650.00	12300.00
3.00	4000.00	17730.00
4.00	5340.00	23000.00
5.00	6300.00	28300.00

(C2.3) PEO1_40 + HTAC in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	Run 1	Run 2
0.00	10.72	10.75
0.05	17.50	17.80
0.10	21.20	21.30
0.15	26.80	26.90
0.20	31.50	31.90
0.25	34.80	34.70
0.30	38.60	--
0.40	45.80	--
0.50	52.40	52.20
0.60	59.90	59.60
0.70	65.10	64.90
0.80	71.70	71.60
0.90	80.20	80.30
1.00	88.10	88.30
3.00	181.40	181.00
5.00	243.00	242.00

(C2.4) PEO1_200 + HTAC in aqueous solution

HTAC (mM)	Conductance (μS/cm)			
	Run 1	Run 2	Run 3	Run 4
0.00	12.07	12.37	13.46	13.54
0.05	15.02	15.01	--	--
0.10	20.06	20.08	20.23	20.34
0.15	26.50	26.40	--	--
0.20	28.40	28.60	--	--
0.30	36.30	36.40	--	--
0.40	43.30	43.40	--	--
0.50	50.50	50.80	--	--
0.60	57.00	57.00	--	--
0.70	63.00	62.90	--	--
0.80	73.30	73.20	72.90	73.00
0.90	81.60	81.50	81.80	--
1.00	88.50	88.60	88.30	88.40
2.00	144.80	145.80	147.60	--
3.00	181.70	181.00	178.00	--
5.00	240.00	241.00	-	--

(C2.5) PEO6_40 + HTAC in aqueous solution

HTAC (mM)	Conductance (μS/cm)		
	Run 1	Run 2	Run 3
0.00	13.65	--	--
0.05	16.71	--	--
0.06	17.77	17.44	--
0.08	18.98	18.00	17.58
0.09	19.80	18.01	18.55
0.14	22.70	--	--
0.23	32.90	30.80	--
0.25	36.20	--	--
0.30	38.90	37.80	--
0.35	45.80	45.70	46.00
0.36	45.90	45.20	--
0.40	48.90	49.10	--
0.50	55.70	53.60	--
0.55	60.80	59.70	--
0.60	65.00	66.40	--
0.72	78.00	77.20	76.60
0.91	95.30	96.30	94.50
1.00	95.30	96.40	--
1.30	138.90	139.00	--
1.50	145.60	145.80	--
3.00	177.60	175.90	--
5.00	239.00	240.00	--

(C2.6) PEO6_40 + HTAC + NaSal in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	[NaSal/[HTAC] = 1	[NaSal/[HTAC] = 5
0.00	13.65	13.65
0.10	45.30	98.05
0.20	64.30	173.85
0.30	93.20	261.00
0.50	132.70	424.00
0.70	181.40	584.00
0.90	248.00	746.00
1.00	252.00	817.33
2.00	430.00	1495.50
3.00	590.00	2170.00
4.00	766.00	2850.00
5.00	918.00	3500.00

(C2.7) PEO6_200 + HTAC in aqueous solution

HTAC (mM)	Conductance (µS/cm)	
	Run 1	Run 2
0.00	9.12	9.13
0.02	10.83	10.97
0.04	12.05	12.15
0.06	14.12	14.04
0.08	15.37	15.62
0.10	16.96	16.72
0.20	25.50	25.90
0.30	35.10	35.20
0.40	43.50	43.60
0.50	50.10	49.90
1.00	97.00	95.80
3.00	183.50	184.60
5.00	242.00	243.00
7.00	302.00	303.00
10.00	389.00	390.00
20.00	659.00	661.00
30.00	960.00	958.00
50.00	1516.00	1518.00

(C2.8) PEO6_200 + HTAC + NaSal in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	[NaSal/[HTAC] = 1	[NaSal/[HTAC] = 5
0.00	9.13	9.13
0.10	49.30	138.00
0.20	76.40	203.00
0.30	102.10	301.00
0.50	141.15	460.00
0.70	208.50	623.00
0.90	247.00	782.50
1.00	281.50	883.50
2.00	462.50	1586.50
3.00	622.00	2180.00
4.00	772.00	2900.00
5.00	920.50	3565.00

(C 2.9) PEO20_15 + HTAC in aqueous solution

HTAC (mM)	Conductance (μS/cm)		
	Run 1	Run 2	Run 3
0.00	12.80	12.99	13.00
0.05	15.97	15.80	--
0.15	28.70	29.60	29.40
0.20	39.60	39.40	30.30
0.30	42.10	41.90	42.20
0.40	51.90	52.00	51.60
0.50	60.90	61.00	61.20
0.60	68.70	69.10	71.90
0.80	86.50	86.00	86.30
0.90	90.50	90.20	112.20
1.00	102.30	104.30	--
2.00	170.70	172.80	181.00
3.00	222.30	220.20	219.50
5.00	298.00	296.00	--

(C2.10) PEO20_15 + HTAC + NaSal in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	[NaSal/[HTAC] = 1	[NaSal/[HTAC] = 5
0.00	12.93	12.93
0.10	40.43	101.70
0.20	76.20	146.87
0.30	87.40	278.75
0.50	141.07	439.50
0.70	193.55	588.50
0.90	229.50	727.00
1.00	253.00	816.25
2.00	435.00	1489.00
3.00	602.33	2195.00
4.00	773.67	2850.00
5.00	961.50	3505.00

(C2.11) PEO20_200 + HTAC in aqueous solution

HTAC (mM)	Conductance (μS/cm)		
	Run 1	Run 2	Run 3
0.00	17.54	17.55	--
0.05	24.20	24.19	--
0.10	32.70	32.90	--
0.20	47.80	48.00	--
0.30	59.00	59.20	--
0.40	70.00	70.10	--
0.50	77.60	77.70	--
0.60	86.80	86.90	--
0.70	96.40	95.30	--
0.80	106.10	109.10	--
0.90	114.10	119.80	116.10
1.00	121.60	120.80	--
2.00	184.70	188.00	187.00
3.00	228.00	226.00	227.00
5.00	294.00	296.00	297.00

(C2.12) PEO20_200 + HTAC + NaSal in aqueous solution

HTAC (mM)	Conductance (μS/cm)	
	[NaSal/[HTAC] = 1	[NaSal/[HTAC] = 5
0.00	17.55	17.55
0.10	48.40	135.20
0.20	90.30	201.00
0.30	101.00	289.00
0.50	155.10	452.00
0.70	207.00	611.50
0.90	244.00	758.50
1.00	268.00	807.00
2.00	436.00	1590.00
3.00	602.00	2360.00
4.00	762.50	2730.00
5.00	991.50	3640.00

Appendix D Rheological Data of Water at 30°C

$$\tau_w = (M_{DCU} - M_{SCU})K_\tau \qquad K_\tau = \frac{1}{2\pi L(R_{IB})^2} \qquad \dot{\gamma} = \dot{\theta} K_\gamma$$

$$\%DR = \frac{f_o - f}{f_o} \times 100$$

$$K_\gamma = \frac{2}{\left(1 - \left(\frac{R_{IC}}{R_{IB}}\right)^2\right)} \qquad \mathrm{Re} = \frac{\dot{\theta} R_{IC}(R_{IB} - R_{IC})}{\nu} \qquad f = \frac{2\tau_w}{\rho\left(\dot{\theta} R_{IC}\right)^2}$$

where

τ_w = inner wall shear stress (N/m^2)

M_{DCU} = total torque measuring from double Couette cell (N.m)

M_{SCU} = total torque measuring from single Couette cell (N.m)

K_τ = stress constant = 12207.62 m^3

L = bob length (m)

R_{IB} = inner radius of bob (m) R_{IC} = inner radius of cub (m)

$\dot{\gamma}$ = shear rate (m^{-1}) $\dot{\theta}$ = motor angular velocity (rad/m)

K_γ = strain constant = 6.61

υ = kinematic viscosity (m^2/s)

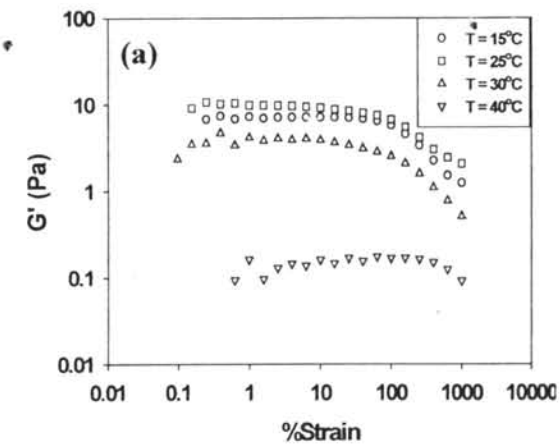
f = friction factor of solution f_o = friction factor of solvent

ρ = density of solvent (kg/m^3)

M_{DCU}			M_{SCU}			τ_{inner}			$\dot{\gamma}$	$\dot{\theta}$	Re	f		
Run 1	Run 2	Run 3	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3				Run 1	Run 2	Run 3
1.433e-6	1.46e-6	1.69e-6	1.79e-7	2.52e-7	2.16e-7	0.015	0.015	0.018	6.31	0.95	93.21	0.650	0.626	0.763
1.637e-6	1.76e-6	1.88e-6	2.22e-7	3.24e-7	2.69e-7	0.017	0.017	0.020	7.36	1.11	108.68	0.540	0.546	0.615
1.899e-6	2.03e-6	2.16e-6	2.45e-7	3.58e-7	2.84e-7	0.020	0.020	0.023	8.58	1.30	126.71	0.464	0.469	0.528
2.219e-6	2.31e-6	2.49e-6	2.58e-7	3.50e-7	3.10e-7	0.024	0.024	0.027	10.00	1.51	147.73	0.405	0.406	0.450
2.505e-6	2.77e-6	2.81e-6	3.08e-7	3.93e-7	3.67e-7	0.027	0.029	0.030	11.66	1.76	172.24	0.334	0.361	0.371
2.988e-6	3.16e-6	3.28e-6	3.67e-7	4.19e-7	3.94e-7	0.032	0.033	0.035	13.59	2.06	200.82	0.293	0.306	0.322
3.488e-6	3.70e-6	3.80e-6	4.43e-7	4.74e-7	4.68e-7	0.037	0.039	0.041	15.85	2.40	234.14	0.250	0.265	0.274
4.051e-6	4.30e-6	4.45e-6	4.93e-7	5.50e-7	5.40e-7	0.043	0.046	0.048	18.48	2.80	272.99	0.215	0.227	0.237
4.702e-6	4.98e-6	5.16e-6	5.48e-7	6.38e-7	6.28e-7	0.051	0.053	0.055	21.54	3.26	318.28	0.185	0.193	0.202
5.468e-6	5.89e-6	6.02e-6	6.22e-7	7.18e-7	7.58e-7	0.059	0.063	0.064	25.12	3.80	371.09	0.159	0.169	0.172
6.451e-6	6.93e-6	7.00e-6	7.40e-7	8.36e-7	8.90e-7	0.070	0.074	0.075	29.29	4.43	432.66	0.138	0.147	0.147
7.573e-6	8.12e-6	8.28e-6	8.71e-7	9.72e-7	1.03e-6	0.082	0.087	0.089	34.15	5.17	504.44	0.119	0.127	0.128
8.977e-6	9.52e-6	9.69e-6	1.04e-6	1.14e-6	1.25e-6	0.097	0.102	0.103	39.81	6.02	588.14	0.103	0.109	0.110
10.55e-6	1.12e-5	1.14e-5	1.26e-6	1.33e-6	1.44e-6	0.113	0.120	0.121	46.42	7.02	685.72	0.089	0.094	0.095
12.43e-6	1.32e-5	1.34e-5	1.49e-6	1.56e-6	1.73e-6	0.134	0.142	0.143	54.12	8.19	799.49	0.077	0.082	0.082
14.71e-6	1.56e-5	1.57e-5	1.78e-6	1.82e-6	2.04e-6	0.158	0.168	0.167	63.10	9.55	932.13	0.067	0.071	0.071
17.42e-6	1.84e-5	1.87e-5	2.13e-6	2.18e-6	2.42e-6	0.187	0.199	0.199	73.56	11.13	1086.79	0.058	0.062	0.062
20.73e-6	2.19e-5	2.22e-5	2.51e-6	2.55e-6	2.85e-6	0.223	0.236	0.237	85.77	12.98	1267.10	0.051	0.054	0.054
24.55e-6	2.60e-5	2.64e-5	2.97e-6	3.01e-6	3.35e-6	0.264	0.280	0.281	100.00	15.13	1477.33	0.045	0.047	0.048
29.23e-6	3.09e-5	3.12e-5	3.54e-6	3.58e-6	3.97e-6	0.314	0.334	0.333	116.59	17.64	1722.44	0.039	0.042	0.041
34.97e-6	3.69e-5	3.73e-5	4.21e-6	4.24e-6	4.71e-6	0.376	0.399	0.398	135.94	20.57	2008.23	0.034	0.037	0.036
41.94e-6	4.41e-5	4.45e-5	5.03e-6	5.03e-6	5.62e-6	0.451	0.477	0.474	158.49	23.98	2341.41	0.030	0.032	0.032
50.12e-6	5.26e-5	5.29e-5	5.97e-6	6.05e-6	6.72e-6	0.539	0.568	0.564	184.79	27.96	2729.89	0.027	0.028	0.028
60.19e-6	6.27e-5	6.31e-5	7.13e-6	7.23e-6	7.99e-6	0.648	0.678	0.673	215.44	32.60	3182.82	0.024	0.025	0.025
72.31e-6	7.49e-5	7.55e-5	8.43e-6	8.64e-6	9.45e-6	0.780	0.808	0.807	251.19	38.01	3710.90	0.021	0.022	0.022
86.66e-6	8.93e-5	8.99e-5	9.81e-6	1.00e-5	1.12e-5	0.938	0.967	0.961	292.87	44.32	4326.59	0.019	0.019	0.019
104.1e-6	1.06e-4	1.07e-4	1.18e-5	1.19e-5	1.32e-5	1.127	1.147	1.149	341.46	51.67	5044.43	0.016	0.017	0.017

Appendix E Rheological Data on Isotropic Phase of Wormlike Micelles in Aqueous Solutions Containing Cationic Surfactant, Sodium Salicylate and Poly(ethylene oxide)

E1 Temperature effect data for aqueous solutions of HTAC 50 mM + [NaSal]/[HTAC] = 1 without PEO



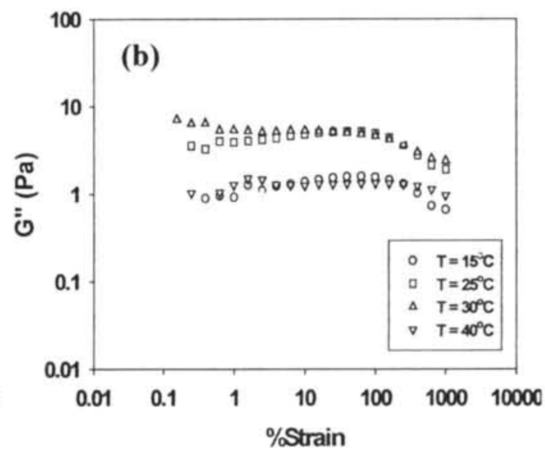


Figure 1.1 The plots of storage modulus, G' **(a)** and loss modulus, G" **(b)** on %strain at different temperatures for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1, the mole ratio of NaSal to HTAC equal to one.

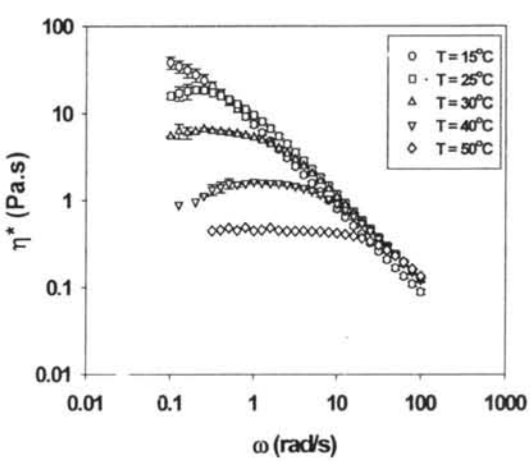


Figure 1.2 Dependence of dynamic viscosity, η^* on frequency, ω at different temperatures for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1, the mole ratio of NaSal to HTAC equal to one.

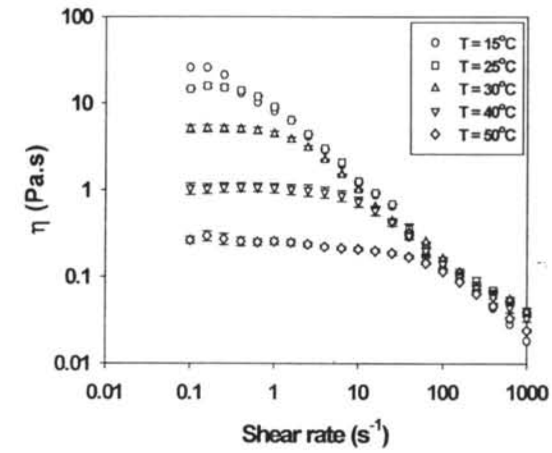


Figure 1.3 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different temperatures for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1, the mole ratio of NaSal to HTAC equal to one.

E2 Temperature effect data for aqueous solutions of HTAC 50 mM + [NaSal]/[HTAC] = 1 in the presence of PEO

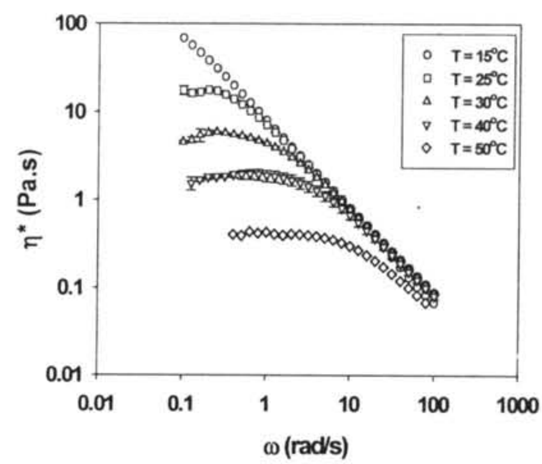


Figure 2.1 Dependence of dynamic viscosity, η^* on frequency, ω at different temperatures for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 + PEO 5 g/l, the mole ratio of NaSal to HTAC equal to one and PEO M_w 1 x 10^5 g/mol.

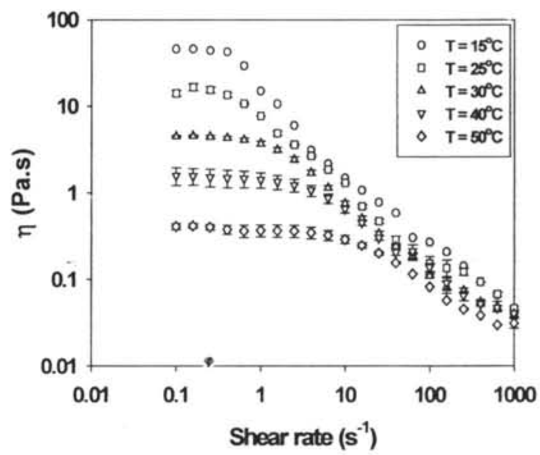


Figure 2.2 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different temperatures for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 + PEO 5 g/l, the mole ratio of NaSal to HTAC equal to one and PEO M_w 1 x 10^5 g/mol.

E3 PEO concentration effect data for aqueous solutions of HTAC 50 mM + PEO + [NaSal]/[HTAC] = 1 at 30°C

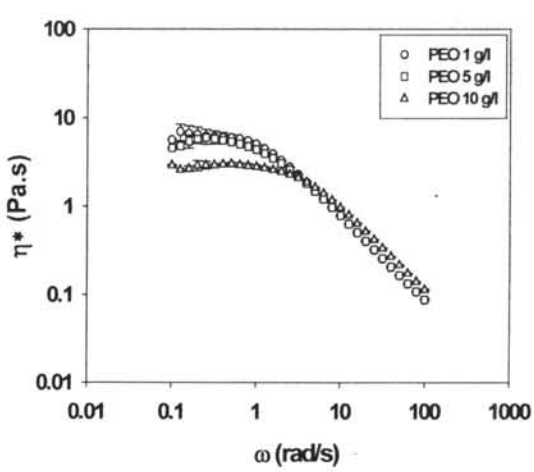


Figure 3.1 Dependence of dynamic viscosity, η^* on frequency, ω at different PEO concentrations for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 + PEO at 30°C, the mole ratio of NaSal to HTAC equal to one and PEO M_w 1 x 10^5 g/mol.

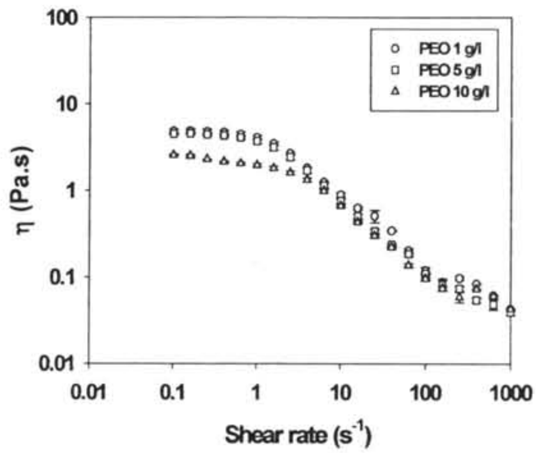


Figure 3.2 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different PEO concentrations for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 + PEO at 30°C, the mole ratio of NaSal to HTAC equal to one and PEO M_w 1 x 10^5 g/mol.

E4 Salt concentration effect data for aqueous solutions of HTAC 50 mM + NaSal without PEO at 30°C

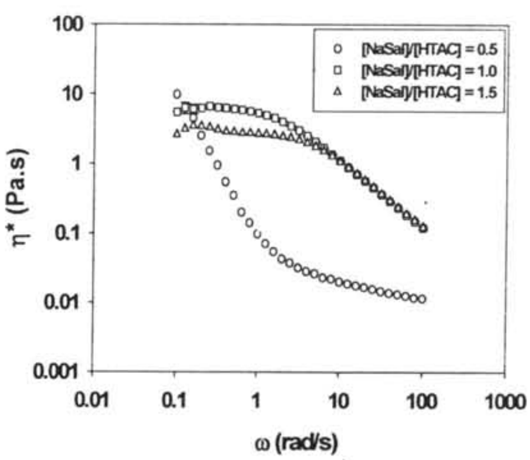


Figure 4.1 Dependence of dynamic viscosity, η^* on frequency, ω at different mole ratios of NaSal to HTAC for aqueous solutions of HTAC 50 mm and NaSal at 30°C.

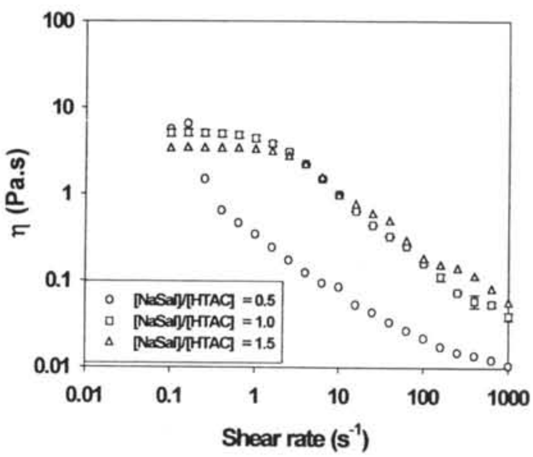


Figure 4.2 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different mole ratios of NaSal to HTAC for aqueous solutions of HTAC 50 mm and NaSal at 30°C.

<u>E5 Salt concentration effect data for aqueous solutions of HTAC 50 mM + NaSal in the presence of PEO at 30°C</u>

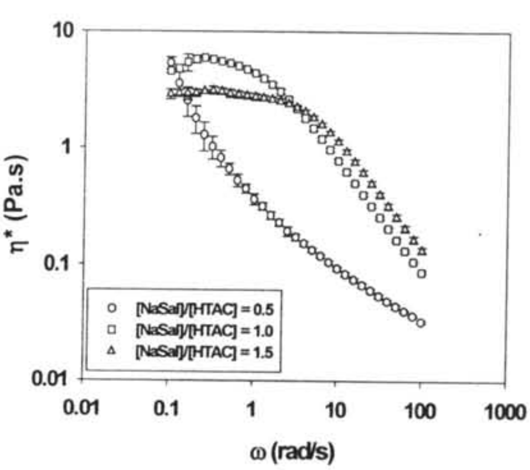


Figure 5.1 Dependence of dynamic viscosity, η^* on frequency, ω at different mole ratios of NaSal to HTAC for aqueous solutions of HTAC 50 mm + NaSal + PEO 5 g/l at 30°C, PEO M_w 1 x 10^5 g/mol.

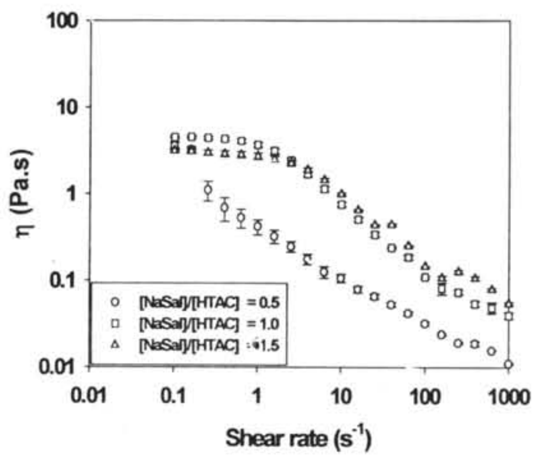


Figure 5.2 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different mole ratios of NaSal to HTAC for aqueous solutions of HTAC 50 mm + NaSal + PEO 5 g/l at 30°C, PEO M_w 1 x 10^5 g/mol.

E6 HTAC concentration effect data for aqueous solutions of HTAC 50 mM + [NaSal]/[HTAC] = 1 without PEO at 30°C

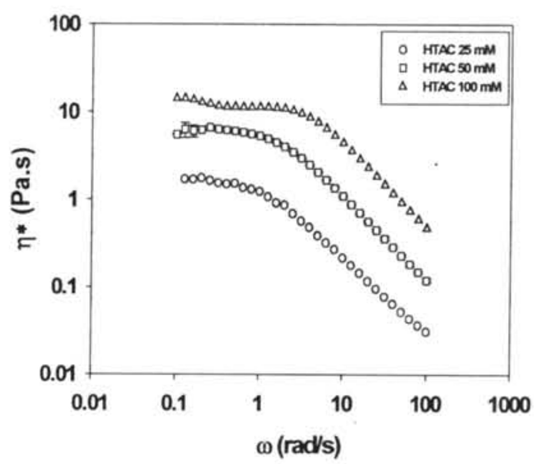


Figure 6.1 Dependence of dynamic viscosity, η^* on frequency, ω at different HTAC concentrations for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 at 30°C, the mole ratio of NaSal to HTAC equal to one.

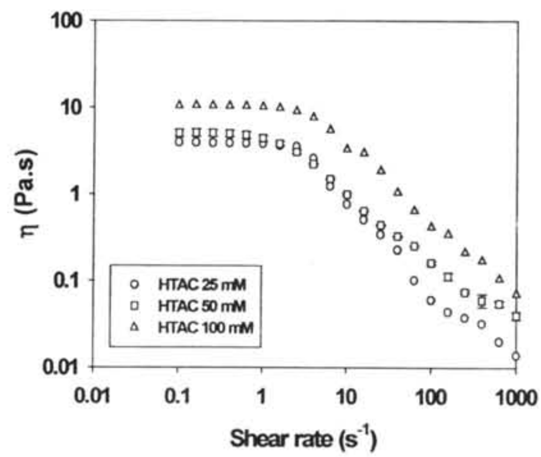


Figure 6.2 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different HTAC concentrations for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 at 30°C, the mole ratio of NaSal to HTAC equal to one.

E7 HTAC concentration effect data for aqueous solutions of HTAC 50 mM + [NaSal]/[HTAC] = 1 in the presence of PEO at 30°C

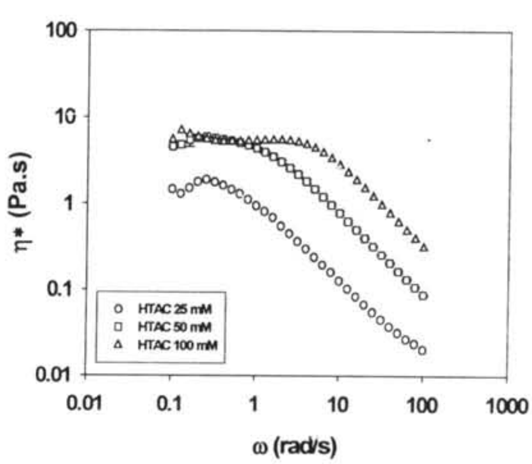


Figure 7.1 Dependence of dynamic viscosity, η^* on frequency, ω at different HTAC concentrations for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 + PEO 5 g/l at 30°C, the mole ratio of NaSal to HTAC equal to one and PEO M_w 1 x 10^5 g/mol.

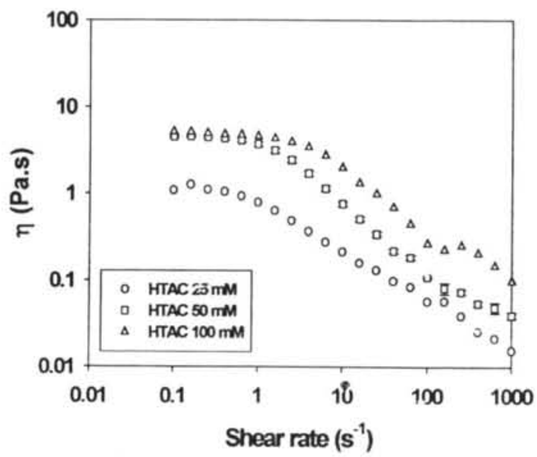


Figure 7.2 Dependence of shear viscosity, η on shear rate, $\dot{\gamma}$ at different HTAC concentrations for aqueous solutions of HTAC 50 mm + [NaSal]/[HTAC] = 1 + PEO 5 g/l at 30°C, the mole ratio of NaSal to HTAC equal to one and PEO M_w 1 x 10^5 g/mol.

Appendix F Critical Reynolds number, Re for Taylor Instability and Turbulent Flow Transition

Table 1 Critical values of $R_{c,1}((r_o - r_i)/r_i)^{1/2}$ for different values of $\eta = r_i/r_o$ and $\mu = \Omega_o/\Omega_i = 0$

Radius ratio, η	$R_{c,1}((r_o - r_i)/r_i)^{1/2}$	References*
1.00	41.18	J. Walowit et al. 1964[a]
0.95	42.44	P.H. Roberts. 1965[b]
0.90	43.87	P.H. Roberts. 1965
0.85	45.50	P.H. Roberts. 1965
0.80	47.37	J. Walowit et al. 1964
0.75	49.52	P.H. Roberts. 1965
0.70	52.04	J. Walowit et al. 1964
0.65	55.01	P.H. Roberts. 1965
0.60	58.56	J. Walowit et al. 1964
0.50	68.19	P.H. Roberts. 1965
0.40	83.64	J. Walowit et al. 1964
0.30	118.89	J. Walowit et al. 1964
0.20	176.26	P.H. Roberts. 1965
0.10	423.48	E.M. Sparrow et al. 1974[c]

Note: $R_{c,1}$ = a critical Reynolds number for Taylor instability

$R_{c,1} = \Omega_I r_i(r_o - r_I)/\nu$

r_o = a radius of outer cylinders

r_i = a radius of inner cylinders

η = a dimensionless radius ratio

Ω_o = an angular velocity of outer cylinders

Ω_I = an angular velocity of inner cylinders

μ : a dimensionless angular ratio

ν : a kinematic viscosity of solution

[a]J. Walowit, S. Tsao, R.C. DiPrima: Stability of flow between arbitrarily spaced concentric cylindrical surfaces including the effect of a radial temperature gradient. Trans. Am. Soc. Mech. Eng., *J. Appl. Mech* 31, 585-593 (1964)

[b]P.H. Roberts: The solution of the characteristic value problems. *Proc. R. Soc. London A,* 283, 550-556 (1965)

[c]E.M. Sparrow, W.D. Munro, V.K. Jonsson: Instability of the flow between rotating cylinders: the wide gap problem. *J. Fluid Mech.* 20, 35-46 (1964)

Table 2 Critical values of $T_{c,1}$ for instability of the flow between rotating cylinders for different values of $\eta = r_i/r_o$ and $\mu = \Omega_o/\Omega_i = 0$

Radius ratio η	Critical Taylor number $T_{c,1}$	References
0.95	15170000	
0.75	20930	
0.50	74390	E.M. Sparrow, W.D. Munro and V.K. Jonsson. 1964[a]
0.35	176400	
0.25	679000	
0.10	3460000	

Note: $T_{c,1}$= a critical Taylor number for Taylor instability , $T_{c,1} = \Omega_1{}^2 r_0{}^4/\nu^2$

r_o = a radius of outer cylinders

r_i = a radius of inner cylinders

η = a dimensionless radius ratio

Ω_o = an angular velocity of outer cylinders

Ω_I = an angular velocity of inner cylinders

μ = a dimensionless angular ratio

ν = a kinematic viscosity of solution

[a]E.M. Sparrow, W.D. Munro, V.K. Jonsson: Instability of the flow between rotating cylinders: the wide gap problem. *J. Fluid Mech. 20*, 35-46 (1964)

Table 3 Critical values of $R_{c,2}$ for wavy vortex flow

Radius ratio η	Critical Reynolds number $R_{c,2}$	References
0.95	$1.05\ R_{c,1} - 1.10\ R_{c,1}$	H.A. Snyder (1969)[a], H.A. Snyder and R. B. Lambert
0.50	$10\ R_{c,1}$	(1966)[b], W. Debler et al. (1969)[c]

Note: $R_{c,1}$ = a critical Reynolds number for Taylor instability

$R_{c,2}$ = a critical Reynolds number for wavy vortex flow (the flow at which the axisymmetri Taylor vortex flow becomes unstable)

[a]H.A. Snyder: Change in waveform and mean flow associated with wavelength variations in rotating Couette flow. Part 1. *J. Fluid Mech. 35*, 337-352 (1969)

[b]H.A. Snyder, R.B. Lambert: Harmonic generation in Taylor vortices between rotating cylinders. *J. Fluid Mech. 26*, 545-562 (1966)

[c]W. Debler, E. Funer, B. Schaaf: "Torque and Flow Patterns in Supercritical Circular Couette Flow", in Proceedings of the Twelf[th] *Internationai Congress of Applied Mechanics*, 1968, ed. By M. Hetenyi, W.G. Vincenti (Springer, Berlin, Heidlberg, New York,1969)

Table 4 Experiments on the transition to turbulence between concentric cylinders with the inner cylinder rotating ($\eta \cong 7/8$)

Radius ratio η	Aspect ratio $h/(r_o - r_i)$	$R_{c,1}$	$R_{c,2}$	$R_{c,3}$	$R_{c,4}$	References
0.840	50	105.1	≈ 1051.0	-	≈ 1891.8 – 3993.8	Schultz-Grunow and Hein (1956)[a]
0.874	27.9	117.7	≈ 1294.7	-	-	Coles (1965)[b]
0.877	20	119.1	≈ 1429.2	-	2608.3	Gollub and Swinney (1975)[c] and Fenstermacher (1979)[d]
0.875	18 to 80	118.2	≈ 1300.2	-	2482.2 – 2955	Walden and Donelly (1979)[e]
0.880	-	$R_{c,1}$	10.4 $R_{c,1}$	12.3 $R_{c,1}$	23.50 $R_{c,1}$	E.L. Koschmieder (1979)[f], D. Coles (1965)[b] ,P.R. Fenstermacher et al. (1979)[d]
0.909	40	137.8	≈ 1653.6	-	2687.1	Bouabdallah and Cognet (1980)[g]
0.896	123	129.1	≈ 1291.0	-	3356.6	Koschmieder (1979)[f]
0908	65	137.1	≈ 754.1	-	2879.1	Mobbs et al. (1979)[h] Barcilon et al. (1979)[i]

Note: $R_{c,1}$ = The critical Reynolds number for Taylor vortex flow

$R_{c,2}$ = The critical Reynolds number for wavy vortex flow

$R_{c,3}$ = The critical Reynolds number for the first appearance of randomness in wavy vortex flow

$R_{c,4}$ = The critical Reynolds number for disappearance of the azimuthal waves and the flow becomes turbulent

h = a height of cylindrical couette cell

η = a dimensionless radius ratio = r_i/r_o

[a]F. Schultz-Grunow, H. Hein: Beitrag zur Couettestromung. Z. *Flugwiss*. 4, 28-30 (1956)

[b]D. Coles: Transition in circular Couette flow. *J. Fluid Mech. 21*, 385-425 (1965)

[c]J.P. Gollub, H.L.Swiney: Onset of turbulence in a rotating fluid. *Phys. Rev. lett.* 35, 927-930 (1975)

[d]P.R. Fenstermacher, H. L. Swinney, J.P. Gollub: Dynamic instabilities and the transition to chaotic Taylor vortex flow. *J. Fluid Mech.* 94, 103-129 (1979)

[e]R.W. Walden, R.J. Donnelly: Reemergent order of chaotic circular Couette flow. *Phys. Rev. Lett*. 35, 927-930 (1975)

[f]E.L. Koschmieder: Turbulent Taylor vortex flow. *J. Fluid Mech*. 93, 515-527 (1979)

[g]A. Bouabdallah, G. Cognet: *"Laminar-turbulent transition in Taylor-Couette flow"*, in Laminar-Turbulent Transition, ed. By R. Eppler and H. Fasel (Springer, Berlin, Heideberg, New York 1980) pp. 368-377

[h]F. R. Mobbs, S. Preston, M.S. Ozogan: *An experimental investigation of Taylor vortex waves*. Taylor Vortex Flow Working Party, Leeds (1979)

[i]A. Barcilon, J. Brindley, M. Leesen, F. R. Mobbs: Marginal instability in Taylor-Couette fllow at very high Taylor number. *J. Fluid Mech.* 94, 453-463 (1979)

Appendix G The number of polymer chains per one eddy at Re = 5000 for poly(ethylene oxide) in aqueous solutions at 30°C

System	PEO M_w	c^*_{PEO}	τ_w	f	u^*	μ	$l_d \times 10^5$	$V_{ed} \times 10^{13}$	$N \times 10^{-6}$	$V_h \times 10^{21}$	$NV_h \times 10^{15}$	% NV_h/V_{ed}
PEO1	91,000	-	-	-	-	-	-	-	-	0.0195	-	-
PEO3	304,000	0.05	0.8287	0.0119	0.0288	0.0008	3.9712	0.3278	3.2452	0.1334	0.4328	1.32
PEO6	606,000	0.04	0.3205	0.0046	0.0179	0.0008	6.4127	1.3801	5.4839	0.2464	1.3515	0.98
PEO9	803,000	0.03	0.1446	0.0021	0.0120	0.0008	9.5339	4.5351	10.200	0.4806	4.9019	1.08
PEO20	1,790,000	0.015	0.1444	0.0021	0.0120	0.0008	9.5258	4.5236	2.2820	1.4484	3.3052	0.73

$$\frac{N}{V} = \frac{cN_a}{M_w}$$

$$N = V_{ed}\left(\frac{cN_a}{M}\right)$$

$$l_d = \frac{\left(\sqrt{2}.\upsilon\right)}{u^*}$$

$$\tau_w = \rho u^{*2}$$

Note:	PEO M_w =		PEO molecular weight (g/mol)
	c^*_{PEO}	=	the optimum PEO concentration (kg/m^3)
	τ_w	=	wall shear stress (N/m^2)
	f	=	friction factor
	u^*	=	friction velocity (m/s)
	μ	=	solution viscosity (Pa.s)
	l_d	=	dissipative length (m)
	V_{ed}	=	volume of one eddy (m^3)
	N	=	the number of polymer chains per one eddy
	V_h	=	hydrodynamic volume of one chain (m^3)
	NV_h	=	total hydrodynamic volume (m^3)
	NV_h/V_{ed}	=	the ratio of total hydrodynamic volume to the volume of one eddy
	Na	=	Avogadro's number
	M_w	=	molecular weight of PEO (kg/mol)
	ρ	=	density of water at 30°C

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