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## APPENDIX A

### Surface Tension Measurements

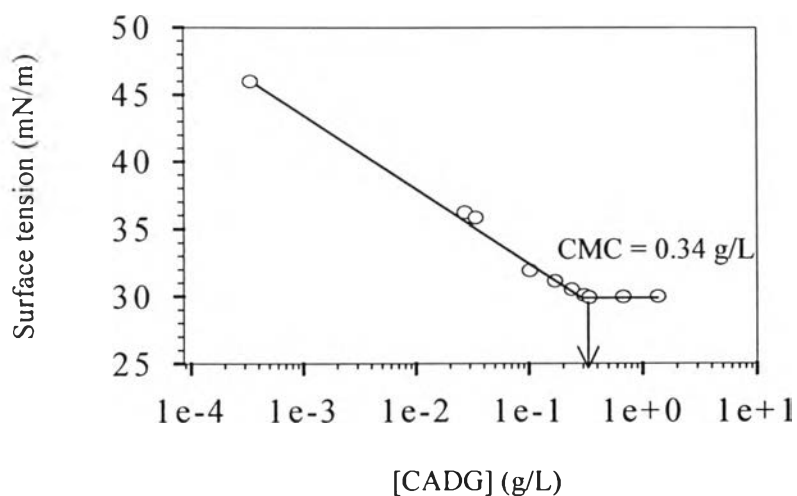
#### The CADG/Water System

**Table A1** Surface tension as a function of the CADG concentration at 30°C for CADG/water system without pH adjustment (Figure 4.1).

[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-4	1.00e-3	56.2	56.6	56.9	57.1	56.96	0.3962
3.42e-3	0.01	49.0	51.0	49.0	38.9	49.40	0.8944
1.03e-2	0.03	45.0	44.6	44.3	44.0	44.48	0.4272
2.05e-2	0.06	42.0	42.0	42.0	42.0	42.00	0.0000
3.42e-2	0.10	40.6	30.9	40.1	30.9	39.75	1.2021
6.84e-2	0.20	37.0	37.0	37.1	37.0	37.00	0.1871
0.14	0.40	34.1	33.7	33.7	33.8	33.75	0.2588
0.21	0.60	33.5	33.5	33.1	33.0	33.22	0.4272
0.34	1.0	30.6	30.8	30.8	31.5	30.80	0.3937
0.68	2.0	30.8	30.8	30.8	30.9	30.89	0.1069
1.03	3.0	31.1	31.1	31.1	31.1	31.12	0.0447
2.05	6.0	31.2	31.2	31.1	31.1	31.13	0.0957
3.42	10.0	31.1	31.1	31.2	31.1	31.13	0.0500

**Table A2** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 1.0.

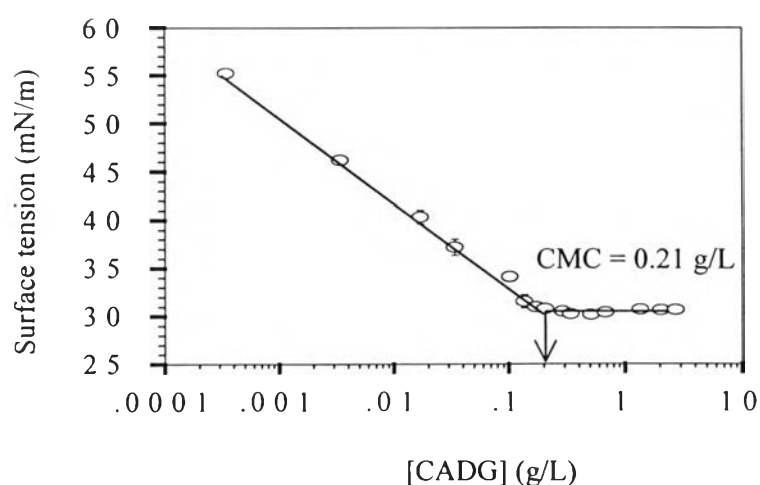
[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-4	1.00e-3	45.9	45.7	46.4	46.0	46.00	0.3606
2.74e-2	0.08	36.5	36.3	36.1	36.1	36.20	0.2000
3.42e-2	0.10	36.0	35.8	35.7	35.8	35.80	0.1225
0.10	0.30	31.7	31.9	32.1	32.0	31.90	0.1581
0.17	0.50	31.4	31.1	31.2	30.9	31.12	0.1924
0.24	0.70	30.8	30.5	30.5	30.4	30.48	0.2168
0.31	0.90	30.2	30.1	29.9	30.0	30.06	0.1140
0.34	1.00	30.2	30.0	29.9	29.7	29.90	0.2121
0.68	2.00	29.9	29.9	29.9	30.0	29.94	0.0548
1.37	4.00	30.0	30.0	30.0	29.9	29.96	0.0548



**Figure A1** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 1.0.

**Table A3** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 3.0.

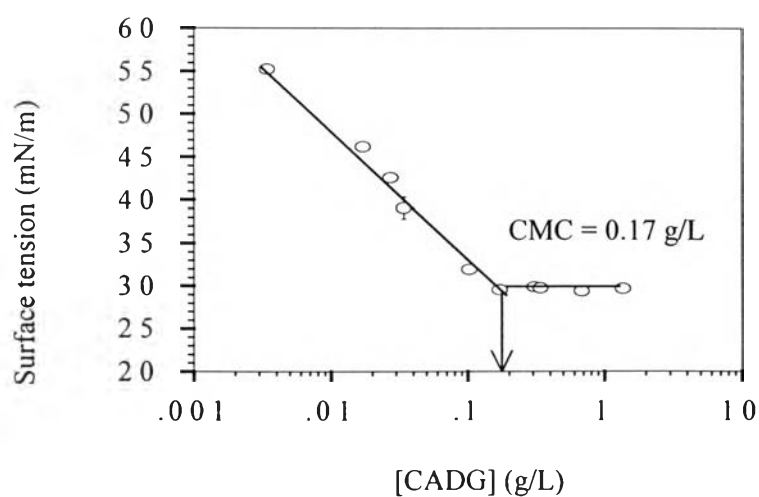
[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-4	1.00e-3	55.2	55.2	55.2	55.4	55.34	0.0894
3.42e-3	1.00e-2	46.5	46.1	45.8	45.9	46.16	0.3286
1.71e-2	0.05	41.3	41.0	40.5	39.8	40.32	0.7305
3.42e-2	0.10	35.8	37.0	37.4	37.7	37.16	0.8325
0.10	0.30	34.6	34.2	34.1	33.8	34.06	0.3847
0.14	0.40	31.3	32.3	31.8	30.7	31.53	0.6850
0.17	0.50	31.3	31.1	30.9	30.8	30.94	0.2702
0.21	0.60	30.9	30.8	30.7	30.7	30.74	0.1140
0.29	0.85	30.6	30.6	30.5	30.4	30.48	0.1304
0.34	1.00	30.3	30.2	30.2	30.2	30.22	0.0447
0.51	1.50	30.1	30.1	30.1	30.2	30.14	0.0548
0.68	2.00	30.3	30.3	30.4	30.5	30.38	0.0837
1.37	3.00	30.8	30.7	30.6	30.7	30.68	0.0837
2.05	6.00	30.7	30.6	30.6	30.6	30.60	0.0707
2.74	8.00	30.6	30.7	30.6	30.6	30.64	0.0548



**Figure A2** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 3.0.

**Table A4** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 5.0.

[CADG] (g/L)	CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-3	0.01	55.5	55.3	55.0	55.1	55.23	0.2217
1.71e-2	0.05	46.8	45.5	46.5	46.0	46.20	0.5715
2.74e-2	0.08	43.0	42.3	42.1	42.9	42.58	0.4425
3.42e-2	0.10	40.7	39.3	38.5	37.8	39.08	1.2447
0.10	0.30	32.0	31.9	31.9	31.9	31.93	0.0500
0.17	0.50	30.0	29.4	29.4	29.4	29.55	0.3000
0.31	0.90	29.9	29.9	29.9	29.9	29.90	0.0000
0.34	1.00	29.7	29.7	29.8	29.8	29.75	0.0577
0.68	2.00	29.5	29.4	29.4	29.3	29.40	0.0816
1.37	3.00	29.7	29.6	29.7	29.8	29.70	0.0816

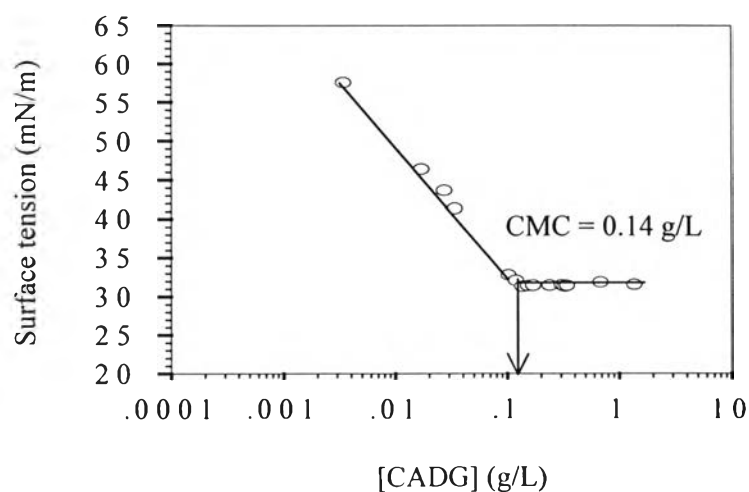


**Figure A3** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 5.0.



**Table A5** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 7.0.

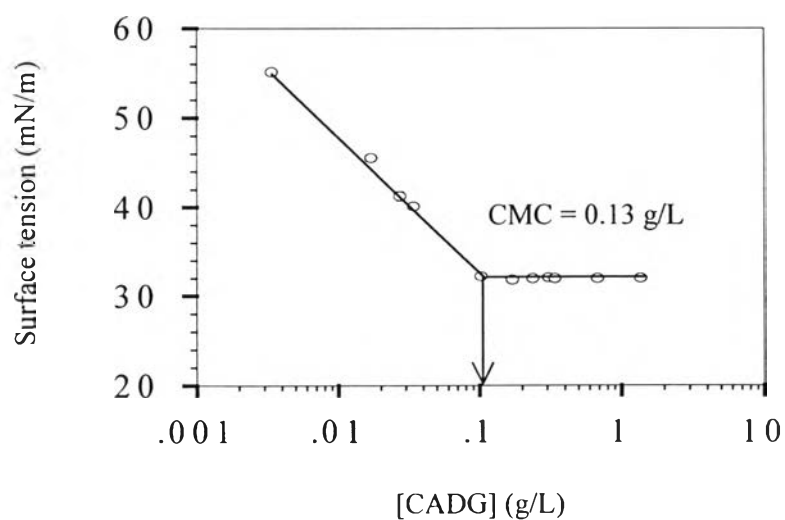
[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-3	0.01	57.7	57.0	57.8	57.8	57.62	0.3493
1.71e-2	0.05	46.4	46.5	46.5	46.3	46.38	0.1304
2.74e-2	0.08	43.9	43.6	43.9	43.3	43.68	0.2872
3.42e-2	0.10	41.0	41.2	41.6	41.6	41.40	0.2828
0.10	0.30	32.4	32.9	33.0	32.9	32.80	0.2708
0.12	0.35	32.3	32.2	32.0	32.0	32.08	0.1643
0.14	0.40	31.4	31.3	31.3	31.4	31.36	0.0548
0.15	0.45	31.5	31.3	31.4	31.4	31.42	0.0837
0.17	0.50	31.6	31.5	31.5	31.4	31.48	0.0837
0.24	0.70	31.4	31.4	31.5	31.5	31.46	0.0548
0.31	0.90	31.5	31.5	31.5	31.6	31.52	0.0447
0.32	0.95	31.3	31.3	31.3	31.4	31.36	0.0894
0.34	1.00	31.3	31.4	31.5	31.5	31.44	0.0894
0.68	2.00	31.7	31.8	31.8	32.0	31.84	0.1140
1.37	3.00	31.6	31.5	31.6	31.6	31.56	0.0548



**Figure A4** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 7.0.

**Table A6** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 9.0.

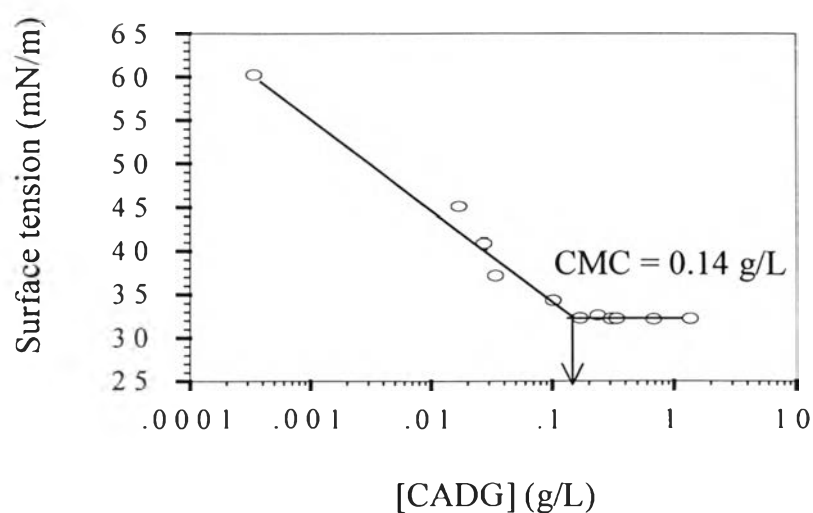
[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.40e-3	0.01	55.0	55.4	55.1	55.0	55.13	0.1893
1.71e-2	0.05	45.8	45.7	45.5	45.1	45.53	0.3096
2.74e-2	0.08	41.9	41.4	41.0	40.7	41.25	0.5196
3.42e-2	0.10	40.1	40.0	40.2	40.1	40.10	0.0816
0.10	0.30	32.3	32.2	32.2	32.1	32.20	0.0816
0.17	0.50	31.9	31.8	31.8	31.8	31.83	0.0500
0.24	0.70	32.0	32.0	32.0	31.9	31.98	0.0500
0.31	0.90	32.2	32.0	32.0	32.0	32.05	0.1000
0.34	1.00	32.1	32.0	32.0	31.8	31.98	0.1258
0.68	2.00	32.0	32.0	32.0	31.9	31.98	0.0500
1.37	3.00	32.1	32.0	31.9	32.0	32.00	0.0816



**Figure A5** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 9.0.

**Table A7** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 10.0.

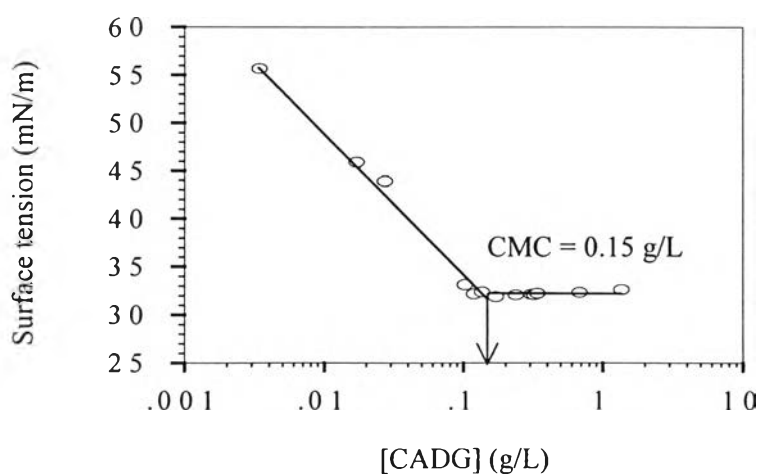
[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-4	1.00e-3	60.7	60.4	60.3	59.6	60.25	0.4655
1.71e-2	0.05	45.8	45.2	44.8	44.6	45.10	0.5292
2.74e-2	0.08	41.8	41.0	40.5	40.2	40.88	0.6994
3.42e-2	0.10	37.7	37.2	37.2	36.6	37.18	0.4500
0.10	0.30	34.4	34.4	34.3	34.1	34.30	0.1414
0.17	0.50	32.5	32.3	32.2	32.0	32.25	0.2082
0.24	0.70	32.7	32.6	32.5	32.5	32.58	0.0957
0.31	0.90	32.3	32.1	32.1	32.2	32.18	0.0957
0.34	1.00	32.4	32.3	32.0	32.1	32.20	0.1826
0.68	2.00	32.1	32.2	32.1	32.2	32.15	0.0577
1.37	3.00	32.1	32.3	32.2	32.3	32.23	0.0957



**Figure A6** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 10.0.

**Table A8** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 12.0.

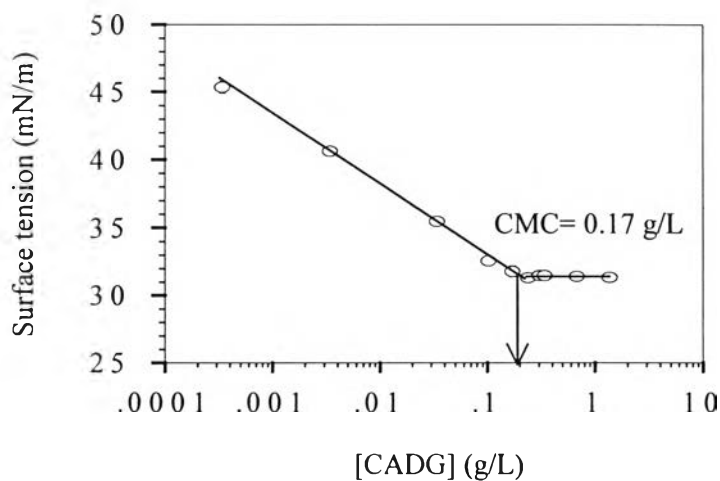
[CAD (g/L)]	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-3	0.01	56.0	55.9	55.8	55.5	55.68	0.3271
1.71e-2	0.05	46.3	46.4	46.0	45.6	45.90	0.5000
2.74e-2	0.08	44.5	44.2	43.7	43.2	43.90	0.5715
0.10	0.30	33.2	33.1	33.1	33.2	33.12	0.0837
0.12	0.35	32.3	32.2	32.0	32.0	32.16	0.1517
0.14	0.40	32.4	32.3	32.3	32.4	32.36	0.0548
0.17	0.50	32.0	32.0	31.9	31.8	31.88	0.1304
0.24	0.70	32.0	32.3	32.0	31.9	32.06	0.1517
0.31	0.90	32.3	32.1	32.2	32.1	32.12	0.1483
0.32	0.95	32.2	32.1	32.0	32.1	32.10	0.0707
0.34	1.00	32.4	32.3	32.2	32.1	32.22	0.1304
0.68	2.00	32.4	32.3	32.3	32.3	32.32	0.0447
1.37	3.00	32.6	32.6	32.7	32.6	32.62	0.0447



**Figure A7** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 12.0.

**Table A9** Surface tension as a function of the CADG concentration at 30°C of CADG/water system at pH 14.0.

[CADG] (g/L)	[CADG] (mM)	Surface tension (mN/m)				Average	SD
		1	2	3	4		
3.42e-4	1.00e-3	45.2	44.8	45.6	45.8	45.35	0.4435
3.42e-3	0.01	40.7	40.8	40.9	40.1	40.63	0.3594
3.42e-2	0.10	35.3	35.5	35.9	35.1	35.45	0.3416
0.10	0.30	32.6	32.3	32.7	32.6	32.55	0.1732
0.17	0.50	31.6	32.0	32.2	31.3	31.78	0.4031
0.24	0.70	31.5	31.2	31.3	31.2	31.30	0.1414
0.31	0.90	31.4	31.6	31.3	31.5	31.45	0.1291
0.34	1.00	31.3	31.5	31.4	31.6	31.45	0.1291
0.68	2.00	31.7	31.5	31.2	31.2	31.40	0.2449
1.37	3.00	31.3	31.4	31.1	31.5	31.33	0.1708



**Figure A8** Surface tension versus CADG concentration at 30°C of CADG/water system at pH 14.0.

**Table A10** Critical micelle concentration (CMC) versus pH value of aqueous CADG solution at 30°C (Figure 4.2).

pH	CMC (g/L)	CMC (mM)
1.0	0.34	1.00
3.0	0.20	0.60
5.0	0.17	0.50
7.0	0.14	0.40
9.0	0.13	0.38
10.0	0.14	0.40
12.0	0.15	0.44
14.0	0.17	0.50

## APPENDIX B

### Viscosity Measurements

#### The CADG/Water System

**Table B1** Viscosity as a function of CADG concentration at 30°C for the CADG/water system (figure 4.3).

[CADG] (g/L)	[CADG] (mM)	Dynamic viscosity (cP)				Average	SD
		1	2	3	4		
0.00	0.00	0.7987	0.8017	0.7985	0.7994	0.7995	1.2895e-3
3.42e-4	1.00e-3	0.8030	0.8046	0.8051	0.8031	0.8038	9.6839e-4
3.42e-3	0.01	0.8034	0.8037	0.8027	0.8030	0.8032	3.8723e-4
6.84e-3	0.02	0.8042	0.8041	0.8041	0.8041	0.8042	1.5126e-4
1.37e-2	0.04	0.8039	0.8037	0.8035	0.8030	0.8036	3.6624e-4
2.05e-2	0.06	0.8039	0.8029	0.8028	0.8028	0.8032	5.6642e-4
2.74e-2	0.08	0.8029	0.8035	0.8035	0.8027	0.8033	5.6003e-4
3.08e-2	0.09	0.8043	0.8033	0.8043	0.8040	0.8041	5.1911e-4
3.42e-2	0.10	0.8037	0.8028	0.8025	0.8030	0.8032	6.2356e-4
6.84e-2	0.20	0.8030	0.8048	0.8042	0.8037	0.8040	6.9837e-4
0.14	0.40	0.8032	0.8026	0.8020	0.8037	0.8032	8.8279e-4
0.21	0.60	0.8051	0.8054	0.8048	0.8042	0.8047	5.8346e-4
0.34	1.00	0.8039	0.8054	0.8044	0.8061	0.8045	1.3524e-3

**Table B2** Viscosity as a function of CADG concentration at 30°C for CADG/water system at pH 3.0 (Figure 4.4).

[CADG] (g/L)	[CADG] (mM)	Dynamic viscosity (cP)				Average	SD
		1	2	3	4		
0.00	0.00	0.8049	0.8055	0.8035	0.8053	0.8048	8.8202e-4
3.42e-3	0.01	0.8081	0.8087	0.8091	0.8089	0.8087	3.5926e-4
1.71e-2	0.05	0.8102	0.8109	0.8099	0.8136	0.8109	1.5161e-3
2.74e-2	0.08	0.8085	0.8091	0.8083	0.8106	0.8090	9.2883e-4
3.42e-2	0.10	0.8053	0.8093	0.8108	0.8073	0.8082	2.3988e-3
0.10	0.30	0.8141	0.8145	0.8141	0.8151	0.8144	4.8432e-4
0.17	0.50	0.8222	0.8128	0.8103	0.8184	0.8142	6.1142e-3
0.24	0.70	0.8099	0.8124	0.8092	0.8100	0.8103	1.2220e-3
0.31	0.90	0.8240	0.8096	0.8112	0.8263	0.8178	8.5563e-3
0.34	1.00	0.8271	0.8105	0.8137	0.8138	0.8151	6.9259e-3
3.42	10.00	0.8154	0.8159	0.8156	0.8153	0.8156	2.6424e-4
10.26	30.00	0.8206	0.8202	0.8201	0.8207	0.8204	2.6845e-4
17.10	50.00	0.8279	0.8279	0.8281	0.8279	0.8280	1.0996e-4
34.20	100.00	0.8409	0.8433	0.8411	0.8412	0.8416	1.1000e-3
68.40	200.00	0.8727	0.8729	0.8732	0.8726	0.8729	2.4226e-4
102.60	300.00	0.9125	0.9086	0.9091	0.9166	0.9117	3.7136e-3



**Table B3** Viscosity as a function of CADG concentration at 30°C for CADG/water system at pH 7.0 (Figure 4.4).

[CADG] (g/L)	[CADG] (mM)	Dynamic viscosity (cP)				Average	SD
		1	2	3	4		
0.00	0.00	0.8049	0.8055	0.8035	0.8053	0.8048	8.8202e-4
3.42e-3	0.01	0.8201	0.8115	0.8197	0.8155	0.8167	4.0431e-3
1.71e-2	0.05	0.8144	0.8168	0.8147	0.8105	0.8141	2.6268e-3
3.42e-2	0.10	0.8389	0.8024	0.8374	0.8106	0.8180	0.0188
0.10	0.30	0.8312	0.8278	0.8364	0.8168	0.8295	7.9147e-3
0.17	0.50	0.8379	0.8399	0.8181	0.8346	0.8282	0.0103
0.24	0.70	0.8304	0.8238	0.8295	0.8210	0.8269	4.2265e-3
0.31	0.90	0.8217	0.8160	0.8208	0.8554	0.8312	0.0153
0.34	1.00	0.8221	0.8242	0.8238	0.8259	0.8240	1.5599e-3
3.42	10.00	0.8311	0.8321	0.8314	0.8360	0.8326	2.2723e-3
10.26	30.00	0.8288	0.8379	0.8361	0.8325	0.8338	4.0327e-3
17.10	50.00	0.8544	0.8512	0.8502	0.8561	0.8530	0.1369
34.20	100.00	0.8822	0.8827	0.8845	0.8829	0.8831	9.9457e-4
68.40	200.00	0.9032	0.9057	0.9050	0.9041	0.9045	1.0863e-3
102.60	300.00	0.9288	0.9280	0.9231	0.9266	0.9266	2.5198e-3

**Table B4** Viscosity as a function of CADG concentration at 30°C for CADG/water system at pH 12.0 (Figure 4.4).

[CADG] (g/L)	[CADG] (mM)	Dynamic viscosity (cP)				Average	SD
		1	2	3	4		
0.00	0.00	0.8079	0.8086	0.8073	0.8197	0.8109	5.8886e-3
3.42e-3	0.01	0.8096	0.8088	0.8094	0.8081	0.8090	6.7515e-4
1.71e-2	0.05	0.8041	0.8054	0.8065	0.8059	0.8055	1.0210e-3
2.74e-2	0.08	0.8094	0.8047	0.8087	0.8066	0.8074	2.1299e-3
3.42e-2	0.10	0.8103	0.8078	0.8102	0.8094	0.8094	1.1467e-3
0.10	0.30	0.8098	0.8092	0.8070	0.8096	0.8089	1.2843e-3
0.17	0.50	0.8079	0.8217	0.8087	0.8085	0.8117	6.6763e-3
0.24	0.70	0.8062	0.8111	0.8064	0.8102	0.8085	2.5202e-3
0.31	0.90	0.8073	0.8199	0.8057	0.8063	0.8098	6.7532e-3
0.34	1.00	0.8141	0.8062	0.8047	0.8098	0.8087	4.1939e-3
3.42	10.00	0.8014	0.8012	0.8010	0.8016	0.8013	2.5820e-4
10.26	30.00	0.8141	0.8145	0.8147	0.8142	0.8144	2.7538e-4
17.10	50.00	0.8196	0.8188	0.8185	0.8194	0.8191	5.1235e-4
34.20	100.00	0.8342	0.8335	0.8317	0.8347	0.8335	1.3124e-3
68.40	200.00	0.8655	0.8624	0.8638	0.8652	0.8642	1.4245e-3
102.60	300.00	0.9087	0.9074	0.9071	0.9080	0.9078	7.0711e-4

The HPC/Water System

**Table B5** Reduced viscosity,  $\eta_{sp}/c$ , as a function of HPC concentration at 30°C for the HPC/water system (Figure 4.5).

[HPC] (g/L)	$\eta_{sp}/c$ (L/g)				Average	SD
	1	2	3	4		
1.00	0.1340	0.1341	0.1342	0.1345	0.1342	2.2867e-4
2.00	0.1417	0.1417	0.1417	0.1417	0.1417	3.3040e-5
3.00	0.1495	0.1495	0.1496	0.1495	0.1495	4.7610e-5
4.00	0.1574	0.1574	0.1572	0.1574	0.1574	7.3258e-5

**Table B6** Inherent viscosity,  $(\ln \eta_r)/c$ , as a function of HPC concentration at 30°C for the HPC/water system (Figure 4.5).

[HPC] (g/L)	$(\ln \eta_r)/c$ (L/g)				Average	SD
	1	2	3	4		
1.00	0.1258	0.1258	0.1259	0.1262	0.1259	2.0265e-4
2.00	0.1247	0.1249	0.1248	0.1249	0.1248	8.4607e-5
3.00	0.1235	0.1235	0.1236	0.1235	0.1235	3.3665e-5
4.00	0.1221	0.1221	0.1220	0.1221	0.1221	4.5092e-5

The HPC/CADG/Water System

**Table B7** Specific viscosity,  $\eta_{sp}$ , as a function of CADG concentration at 30°C for HPC/CADG/water system at pH 3.0. The HPC concentration was fixed at 2.6 g/L (Figure 4.8).

[CADG] (g/L)	[CADG] (mM)	$\eta_{sp}$				Average	SD
		1	2	3	4		
0.00	0.00	0.4069	0.4061	0.4101	0.4108	0.4085	2.3233e-3
3.42e-5	1.00e-4	0.4085	0.4091	0.4088	0.4089	0.4088	2.2869e-4
3.42e-4	1.00e-3	0.4069	0.4068	0.4071	0.4064	0.4068	2.6949e-4
3.42e-3	0.01	0.3985	0.3989	0.3957	0.3948	0.3970	2.0526e-3
8.55e-2	0.25	0.3989	0.3990	0.3979	0.3994	0.3988	6.5803e-4
3.42e-2	0.10	0.3932	0.3935	0.3935	0.3935	0.3934	1.8500e-4
0.14	0.40	0.4043	0.4040	0.4016	0.4011	0.4027	1.5863e-3
0.24	0.70	0.4101	0.4138	0.4110	0.4094	0.4111	1.9478e-3
0.29	0.85	0.4158	0.4100	0.4139	0.4121	0.4130	2.5072e-3
0.34	1.00	0.4222	0.4283	0.4324	0.4298	0.4282	4.3197e-3
0.51	1.50	0.4245	0.4200	0.4200	0.4204	0.4212	2.1990e-3
0.68	2.00	0.4170	0.4212	0.4113	0.4149	0.4161	4.1352e-3
0.86	2.50	0.4131	0.4088	0.4155	0.4153	0.4132	3.1128e-3
1.01	3.00	0.4121	0.4095	0.4083	0.4084	0.4096	1.7747e-3
2.05	6.00	0.4092	0.4076	0.4085	0.4066	0.4080	1.1467e-3
3.08	9.00	0.3980	0.3981	0.3986	0.4003	0.3988	1.0590e-3
4.10	12.00	0.3944	0.3936	0.3933	0.3939	0.3938	4.7794e-4
4.79	14.00	0.4019	0.4019	0.4024	0.4028	0.4022	3.9652e-4
5.47	16.00	0.4064	0.4057	0.4060	0.4058	0.4059	3.0325e-4
6.84	20.00	0.4174	0.4166	0.4167	0.4170	0.4169	3.4102e-4
10.26	30.00	0.4177	0.4188	0.4177	0.4179	0.4180	5.3079e-4
17.10	50.00	0.4217	0.4211	0.4213	0.4196	0.4209	9.0079e-4
34.20	100.00	0.4655	0.4567	0.4579	0.4610	0.4603	3.9132e-3
102.60	300.00	0.5693	0.5709	0.5762	0.5697	0.5715	3.1951e-3

**Table B8** Specific viscosity,  $\eta_{sp}$ , as a function of CADG concentration at 30°C for HPC/CADG/water system at pH 12.0. The HPC concentration was fixed at 2.6 g/L (Figure 4.10; Ubbelohde capillary viscometer size 50).

[CADG] (g/L)	[CADG] (mM)	$\eta_{sp}$				Average	SD
		1	2	3	4		
0.00	0.00	0.4042	0.4043	0.4042	0.4036	0.4041	2.9811e-4
1.71e-8	5.00e-8	0.3983	0.3983	0.3981	0.3985	0.3983	1.7234e-4
3.42e-8	1.00e-7	0.3921	0.3910	0.3923	0.3932	0.3922	8.6965e-4
1.71e-7	5.00e-7	0.3800	0.3805	0.3809	0.3802	0.3804	4.0095e-4
1.71e-5	5.00e-5	0.3725	0.3782	0.3775	0.3778	0.3765	2.6589e-3
3.42e-5	1.00e-4	0.3780	0.3745	0.3741	0.3723	0.3747	2.3967e-3
3.42e-4	1.00e-3	0.3674	0.3674	0.3673	0.3673	0.3674	6.9462e-5
3.42e-3	0.01	0.3682	0.3683	0.3699	0.3676	0.3685	1.0010e-3
3.42e-2	0.10	0.3660	0.3658	0.3689	0.3742	0.3687	3.9392e-3
0.14	0.40	0.3777	0.3716	0.3769	0.3770	0.3758	2.8256e-3
0.24	0.70	0.4004	0.4002	0.4009	0.4018	0.4008	7.0885e-4
0.34	1.00	0.3920	0.3936	0.3995	0.3912	0.3941	3.7671e-3
1.03	3.00	0.3831	0.3837	0.3849	0.3832	0.3837	8.1894e-4
2.05	6.00	0.3759	0.3767	0.3764	0.3770	0.3765	4.7198e-4
3.08	9.00	0.3716	0.3717	0.3719	0.3713	0.3716	2.5684e-4
4.10	12.00	0.3706	0.3694	0.3707	0.3667	0.3693	1.8520e-3
4.79	14.00	0.3801	0.3909	0.3810	0.3886	0.3851	5.3756e-3
5.47	16.00	0.4097	0.3876	0.4011	0.3932	0.3979	9.6159e-3
6.84	20.00	0.4108	0.3972	0.3979	0.4106	0.4041	7.5809e-3
10.26	30.00	0.4136	0.4031	0.4021	0.4132	0.4080	6.2500e-3
17.10	50.00	0.4170	0.4096	0.4148	0.4106	0.4130	3.5241e-3
34.20	100.00	0.4334	0.4366	0.4365	0.4304	0.4342	2.9300e-3

**Table B9** Specific viscosity,  $\eta_{sp}$ , as a function of CADG concentration at 30°C for HPC/CADG/water system at pH 12.0. The HPC concentration was fixed at 2.6 g/L (Figure 4.10; Ubbelohde capillary viscometer size 25).

[CADG] (g/L)	[CADG] (mM)	$\eta_{sp}$				Average	SD
		1	2	3	4		
1.71e-8	5.00e-8	0.3908	0.3931	0.3942	0.3940	0.3930	1.5616e-3
3.42e-8	1.00e-7	0.3859	0.3893	0.3885	0.3899	0.3884	1.7668e-3
1.71e-7	5.00e-7	0.3832	0.3841	0.3858	0.3839	0.3843	1.1126e-3
1.71e-5	5.00e-5	0.3847	0.3828	0.3830	0.3833	0.3834	8.4728e-4
3.42e-5	1.00e-4	0.3824	0.3834	0.3818	0.3812	0.3822	9.1851e-4

**Table B10** Specific viscosity,  $\eta_{sp}$ , as a function of CADG concentration at 30°C for HPC/CADG/water system at pH 9.0. The HPC concentration was fixed at 2.6 g/L (Figure 4.11).

[CADG] (g/L)	[CADG] (mM)	$\eta_{sp}$				Average	SD
		1	2	3	4		
3.42e-5	1.00e-4	0.4011	0.4039	0.4036	0.4067	0.4038	2.3077e-3
3.42e-4	1.00e-3	0.4066	0.3961	0.4078	0.4041	0.4037	5.2669e-3
3.42e-3	0.01	0.4053	0.4035	0.4042	0.4035	0.4041	8.2853e-4
3.42e-2	0.10	0.3919	0.4046	0.3915	0.4038	0.3980	7.2237e-3
0.14	0.40	0.4043	0.4021	0.3958	0.4028	0.4012	3.7349e-3
0.29	0.85	0.4074	0.4079	0.4093	0.4089	0.4084	8.8797e-4
0.34	1.00	0.3962	0.3958	0.3954	0.3953	0.3957	4.2095e-4
0.68	2.00	0.3914	0.3963	0.3953	0.3941	0.3943	2.1162e-3
2.05	6.00	0.3935	0.3947	0.3924	0.3905	0.3928	1.7941e-3
4.10	12.00	0.4052	0.4003	0.4020	0.4010	0.4021	2.1769e-3
5.47	16.00	0.4195	0.4028	0.4203	0.4190	0.4154	8.4220e-3
6.84	20.00	0.4251	0.4316	0.4326	0.4221	0.4278	5.0994e-3
17.10	50.00	0.4403	0.4428	0.4451	0.4461	0.4436	2.5897e-3

## APPENDIX C

### Dynamic Light Scattering Measurements

#### The HPC/Water System

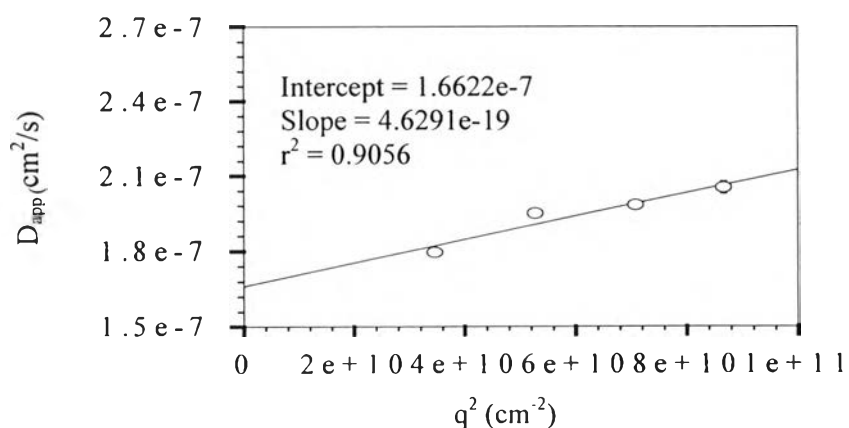
**Table C1** Data for the fixed HPC concentration of 2 g/L for the aqueous HPC solution at various angles(Figure 4.6).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	16.1e-8	10.8	20.7e-8	0.515	90.2	26.5	0.00076
	18.3e-8	12.8	22.8e-8	0.454	92.3	25.3	0.00087
	15.9e-8	10.3	20.9e-8	0.561	77.0	26.2	0.00079
Average	16.8e-8	11.3	21.5e-8	0.510	86.5	26.0	0.00081
SD	1.3317e-8	1.3229	1.1590e-8	0.0537	8.2940	0.6245	5.6862e-5
90	19.9e-8	14.2	24.6e-8	0.437	92.0	26.9	0.00040
	18.8e-8	12.9	23.7e-8	0.484	91.2	26.0	0.00066
	18.9e-8	13.3	23.6e-8	0.455	92.2	27.2	0.00059
Average	19.2e-8	13.5	24.0e-8	0.459	91.8	26.7	0.00055
SD	6.0828e-9	0.6658	5.5076e-9	0.0237	0.5292	0.6245	1.3454e-4
110	20.9e-8	15.6	25.3e-8	0.394	96.9	34.0	0.00044
	20.3e-8	14.7	24.9e-8	0.423	86.1	34.2	0.00050
	20.0e-8	14.3	24.8e-8	0.435	89.2	34.3	0.00049
Average	20.4e-8	14.9	25.0e-8	0.417	90.7	34.2	0.00048
SD	4.5826e-9	0.6658	2.6458e-9	0.0211	5.5609	0.1528	3.2146e-5
130	20.0e-8	14.1	25.0e-8	0.454	91.1	29.2	0.00315
	18.3e-8	12.6	23.0e-8	0.474	88.4	29.8	0.00213
	21.3e-8	16.2	25.5e-8	0.373	89.3	26.9	0.00113
Average	19.9e-8	14.3	24.5e-8	0.434	89.6	28.6	0.00214
SD	1.5044e-8	1.8083	1.3229e-8	0.0535	1.3748	1.5308	1.0100e-3



**Table C2** Data for the fixed HPC concentration of 3 g/L for the aqueous HPC solution at various angles.

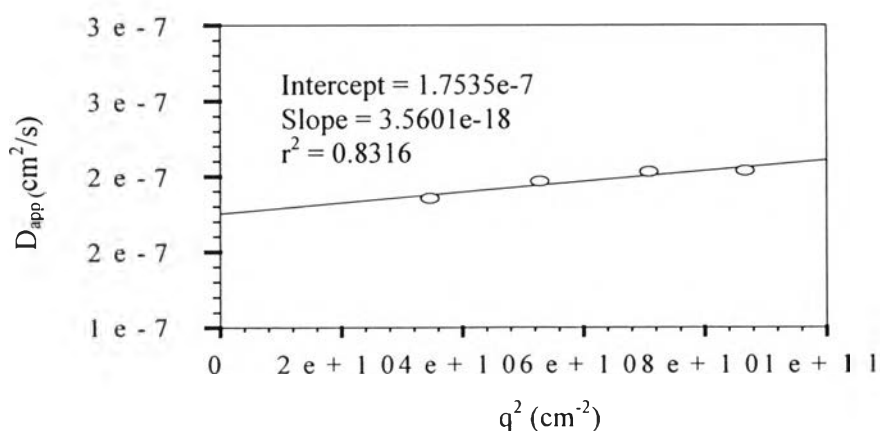
Angle (degree)	$D_{app,mean}$ (cm <sup>2</sup> /s)	Width	$D_{app,Z}$ (cm <sup>2</sup> /s)	Poly dispersity	In Range	Merit	Fit Error
70	18.0e-8	13.4	21.8e-8	0.397	94.6	39.1	0.00051
	17.9e-8	12.6	22.4e-8	0.454	95.2	41.3	0.00083
	18.0e-8	12.5	22.7e-8	0.477	95.8	41.6	0.00131
Average	18.0e-8	12.8	22.3e-8	0.443	95.2	40.7	0.00088
SD	5.7735e-10	0.4933	4.5826e-9	0.0412	0.6000	1.3650	4.0266e-4
90	19.6e-8	14.9	23.6e-8	0.377	95.9	43.0	0.00051
	19.4e-8	13.6	24.4e-8	0.465	99.5	43.5	0.00138
	19.5e-8	14.1	23.8e-8	0.420	97.6	44.0	0.00103
Average	19.5e-8	14.2	23.9e-8	0.421	97.7	43.5	0.00097
SD	1.0000e-9	0.6557	4.1633e-9	0.0440	1.8009	0.5000	4.3776e-4
110	19.8e-8	14.3	24.4e-8	0.428	94.7	43.4	0.00052
	20.0e-8	14.0	24.9e-8	0.456	96.4	44.0	0.00107
	19.7e-8	14.2	24.2e-8	0.425	96.3	44.1	0.00061
Average	19.8e-8	14.2	24.5e-8	0.436	95.8	43.8	0.00073
SD	1.5275e-9	0.1528	3.6056e-9	0.0171	0.9539	0.3786	2.9501e-4
130	20.3e-8	14.8	24.9e-8	0.414	97.2	37.6	0.00040
	20.5e-8	15.4	24.7e-8	0.385	96.7	36.9	0.00055
	20.8e-8	15.2	25.4e-8	0.413	96.7	36.8	0.00108
Average	20.5e-8	15.1	25.0e-8	0.404	96.9	37.1	0.00068
SD	2.5166e-9	0.3055	3.6056e-9	0.0165	0.2887	0.4359	3.5726e-4



**Figure C1** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system. The HPC concentration was fixed at 3 g/L.

**Table C3** Data for the fixed HPC concentration of 4 g/L for the aqueous HPC solution at various angles.

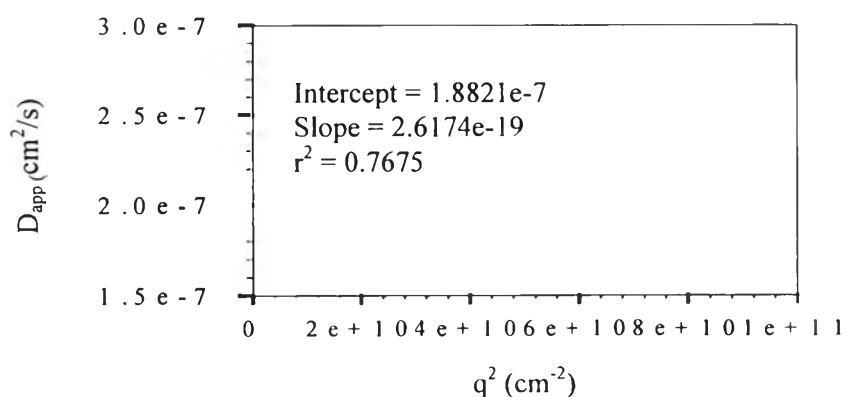
Angle (degree)	$D_{app,mean}$ (cm <sup>2</sup> /s)	Width	$D_{app,Z}$ (cm <sup>2</sup> /s)	Poly dispersity	In Range	Merit	Fit Error
70	18.4e-8	13.5	22.6e-8	0.414	92.9	31.3	0.00069
	18.8e-8	13.4	23.2e-8	0.440	95.1	30.9	0.00052
	18.4e-8	12.7	23.2e-8	0.471	94.9	30.4	0.00056
Average	18.5e-8	13.2	23.0e-8	0.442	94.3	30.9	0.00059
SD	2.3094e-9	0.4359	3.2146e-9	0.0285	1.2166	0.4509	8.8882e-5
90	19.7e-8	14.3	24.1e-8	0.417	99.1	33.7	0.00097
	19.9e-8	13.9	24.8e-8	0.460	96.5	33.3	0.00088
	19.4e-8	14.1	23.9e-8	0.423	92.6	33.7	0.00065
Average	19.7e-8	14.1	24.3e-8	0.433	96.1	33.6	0.00083
SD	2.5166e-9	0.2000	4.7258e-9	0.0233	3.2716	0.2309	1.6503e-4
110	20.0e-8	14.4	24.6e-8	0.430	97.1	32.9	0.00106
	20.6e-8	14.9	25.3e-8	0.422	95.8	33.7	0.00103
	20.3e-8	15.0	24.6e-8	0.400	97.1	36.2	0.00073
Average	20.3e-8	14.8	24.8e-8	0.417	96.7	34.3	0.00094
SD	3.0000e-9	0.3215	4.0415e-9	0.0155	0.7506	1.7214	1.8248e-4
130	20.5e-8	4.1	25.8e-8	0.479	94.1	37.8	0.00137
	20.3e-8	14.2	25.4e-8	0.463	97.4	38.2	0.00072
	20.3e-8	15.1	24.7e-8	0.397	96.6	37.1	0.00054
Average	20.4e-8	14.5	25.3e-8	0.446	96.0	37.7	0.00088
SD	1.1547e-9	0.5508	5.5678e-9	0.0435	1.7214	0.5568	4.3662e-4



**Figure C2** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system. The HPC concentration was fixed at 4 g/L.

**Table C4** Data for the fixed HPC concentration of 5 g/L for the aqueous HPC solution at various angles.

Angle (degree)	$D_{app,mean}$ (cm <sup>2</sup> /s)	Width	$D_{app,Z}$ (cm <sup>2</sup> /s)	Poly dispersity	In Range	Merit	Fit Error
70	19.6e-8	15.0	23.4e-8	0.368	99.7	46.0	0.00042
	19.7e-8	14.4	24.2e-8	0.416	99.3	46.1	0.00102
	19.3e-8	14.1	23.5e-8	0.410	98.6	45.2	0.00093
Average	19.5e-8	14.5	23.7e-8	0.398	99.2	45.8	0.00079
SD	2.0817e-9	0.4583	4.3589e-9	0.0262	0.5568	0.4933	3.2357e-4
90	20.1e-8	14.6	24.7e-8	0.420	97.9	47.4	0.00084
	20.5e-8	15.5	24.6e-8	0.376	99.6	46.9	0.00071
	20.6e-8	15.6	24.9e-8	0.383	99.6	47.2	0.00065
Average	20.4e-8	15.2	24.7e-8	0.393	99.0	47.2	0.00073
SD	2.6458e-9	0.5508	1.5275e-9	0.0236	0.9815	0.2517	9.7125e-5
110	21.0e-8	16.1	25.1e-8	0.367	98.3	45.9	0.00084
	21.1e-8	15.7	25.5e-8	0.393	97.3	45.4	0.00085
	20.6e-8	15.7	24.6e-8	0.370	97.9	45.4	0.00046
Average	20.9e-8	15.8	25.1e-8	0.377	97.8	45.6	0.00072
SD	2.6458e-9	0.2309	4.5092e-9	0.0142	0.5033	0.2887	2.2234e-4
130	21.0e-8	15.1	25.8e-8	0.428	99.2	37.7	0.00077
	20.9e-8	15.5	25.5e-8	0.402	98.9	38.1	0.00075
	20.7e-8	15.2	25.3e-8	0.413	98.5	39.2	0.00088
Average	20.9e-8	15.3	25.5e-8	0.414	98.9	38.3	0.00080
SD	1.5275e-9	0.2082	2.5166e-9	0.0131	0.3512	0.7767	7.0000e-5



**Figure C3** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system. The HPC concentration was fixed at 5 g/L.

**Table C5** The center of mass diffusion coefficient ( $D_c$ ) as a function of HPC concentration at 30°C for the HPC/CADG/water system (Figure 4.7).

[HPC] (g/L)	$D_c$ (cm <sup>2</sup> /s)
2.0	1.5295e-7
3.0	1.6622e-7
4.0	1.7535e-7
5.0	1.8821e-7

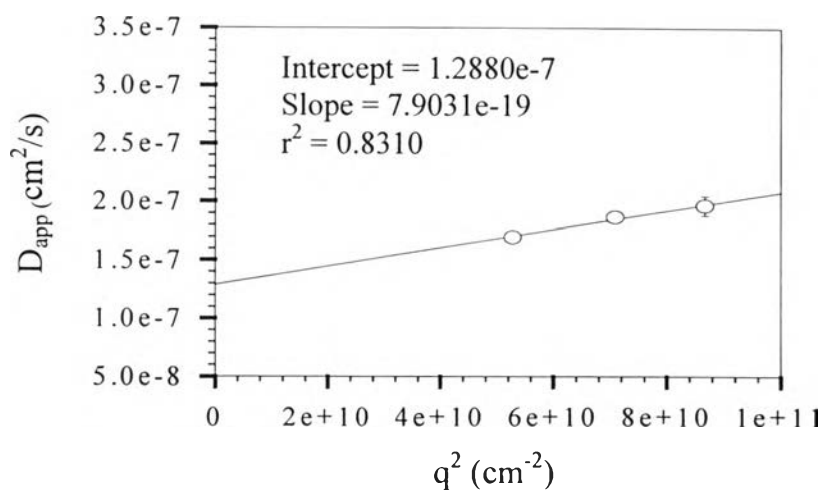
The HPC/CADG/Water System

**Table C6** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 3.42e-5 g/L (1.00e-4 mM) (Figure 4.12 and Figure 4.14).

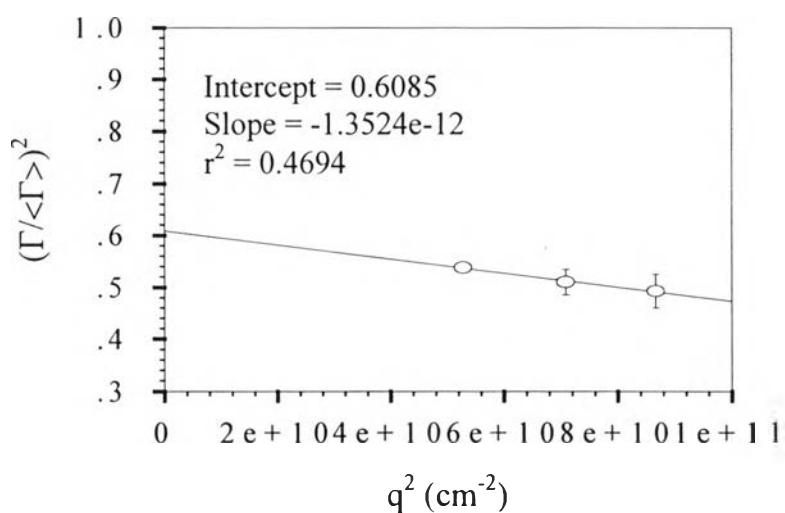
Angle (degree)	$D_{app,mean}$ (cm <sup>2</sup> /s)	Width	$D_{app,z}$ (cm <sup>2</sup> /s)	Poly dispersity	In Range	Merit	Fit Error
70	14.5e-8	9.1	19.1e-8	0.568	92.1	36.5	0.00117
	14.4e-8	9.1	19.2e-8	0.598	93.7	37.0	0.00135
	13.0e-8	8.1	17.7e-8	0.632	83.5	35.6	0.00085
Average	14.0e-8	8.8	18.7e-8	0.599	89.8	36.4	0.00112
SD	8.3865e-9	0.5774	8.3865e-9	0.0320	5.4857	0.7095	2.5325e-4
90	16.9e-8	11.3	21.7e-8	0.517	83.6	26.8	0.00076
	17.6e-8	12.1	22.3e-8	0.487	83.1	25.2	0.00058
	17.2e-8	11.7	21.9e-8	0.493	84.6	27.0	0.00070
Average	17.2e-8	11.7	22.0e-8	0.499	83.8	26.3	0.00068
SD	3.5119e-9	0.4000	3.0551e-9	0.0159	0.7638	0.9866	9.1652e-5
110	16.6e-8	10.9	21.7e-8	0.547	85.6	29.0	0.00091
	17.0e-8	11.3	22.0e-8	0.532	86.6	27.9	0.00088
	17.8e-8	11.9	22.9e-8	0.515	81.0	25.8	0.00088
Average	17.1e-8	11.4	22.2e-8	0.531	84.4	27.6	0.00089
SD	6.1101e-9	0.5033	6.2450e-9	0.0160	2.9866	1.6258	1.7321e-5
130	17.8e-8	11.8	23.1e-8	0.534	89.7	28.1	0.00133
	17.4e-8	11.7	22.3e-8	0.514	93.4	31.0	0.00080
	17.0e-8	11.0	22.3e-8	0.561	94.7	32.1	0.00121
Average	17.4e-8	11.5	22.6e-8	0.536	92.6	30.4	0.00111
SD	4.0000e-9	0.4359	4.6188e-9	0.0236	2.5942	2.0664	2.7791e-4

**Table C7** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 3.42e-4 g/L (1.00e-3 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
90	16.7e-8	10.7	21.1e-8	0.538	84.6	33.4	0.00098
	17.0e-8	11.1	21.6e-8	0.528	88.6	33.4	0.00104
	17.2e-8	11.3	22.5e-8	0.549	90.8	33.9	0.00203
Average	17.0e-8	11.0	21.7e-8	0.538	88.0	33.6	0.00135
SD	2.5166e-9	0.3055	7.0946e-9	0.0105	3.1432	0.2887	5.8966e-4
110	19.1e-8	12.9	24.3e-8	0.500	88.1	29.7	0.00092
	18.1e-8	12.4	23.0e-8	0.492	89.9	29.7	0.00101
	18.8e-8	12.4	24.4e-8	0.538	87.1	29.3	0.00127
Average	18.7e-8	12.6	23.9e-8	0.510	88.4	29.6	0.00107
SD	5.1316e-9	0.2887	7.8102e-9	0.0246	1.4189	0.2309	1.8175e-4
130	18.7e-8	12.6	24.0e-8	0.514	87.7	21.5	0.00044
	20.3e-8	13.5	26.3e-8	0.530	91.1	22.6	0.00098
	19.9e-8	13.8	25.0e-8	0.471	88.1	20.7	0.00046
Average	19.6e-8	13.3	25.1e-8	0.505	89.0	21.6	0.00063
SD	8.3267e-9	0.6245	1.1533e-8	0.0305	1.8583	0.9539	3.0616e-4



**Figure C4** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 3.42e-4 g/L (1.00e-3 mM).

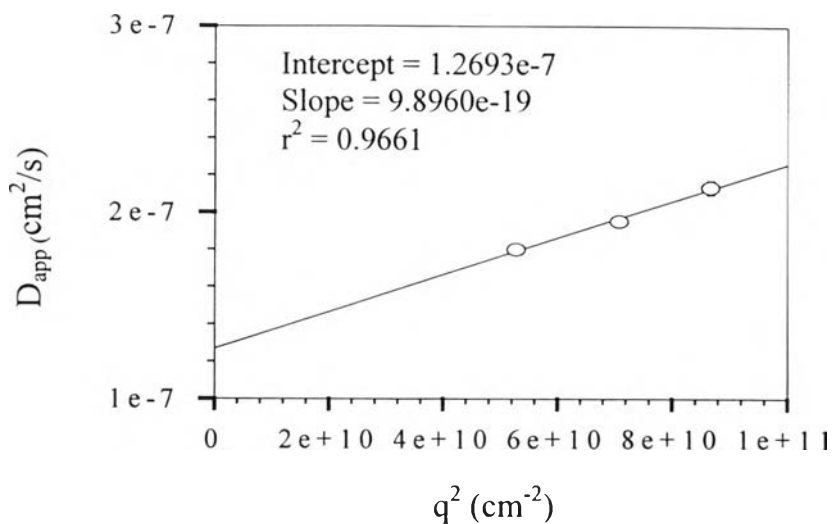


**Figure C5** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 3.42e-4 g/L (1.00e-3 mM).

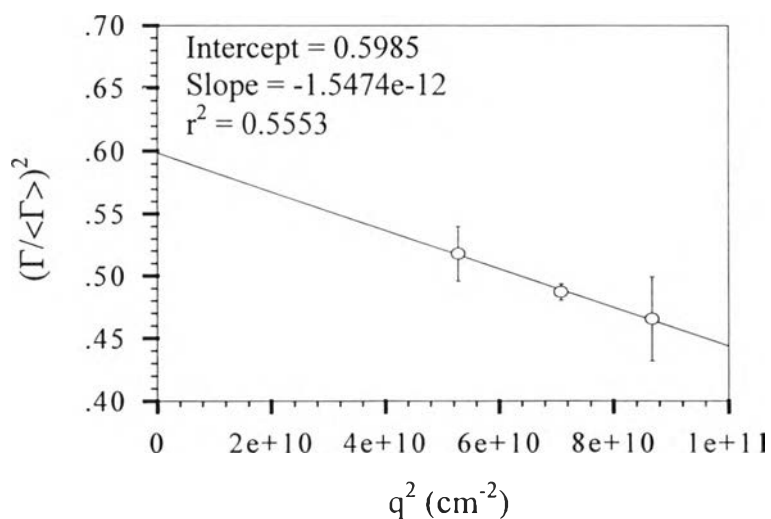
**Table C8** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 3.42e-3 g/L (0.01 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
90	17.9e-8	12.1	22.8e-8	0.506	92.2	39.7	0.00065
	17.9e-8	11.8	23.3e-8	0.543	91.3	40.3	0.00089
	18.2e-8	12.3	23.2e-8	0.504	92.1	40.1	0.00061
Average	18.0e-8	12.1	23.1e-8	0.518	91.9	40.0	0.00072
SD	1.7321e-9	0.2517	2.6458e-9	0.0220	0.4933	0.3055	1.5144e-4
110	19.8e-8	13.5	25.0e-8	0.488	94.7	40.2	0.00084
	19.4e-8	13.2	24.6e-8	0.493	92.9	40.3	0.00068
	19.4e-8	13.3	24.6e-8	0.491	92.1	40.1	0.00076
Average	19.5e-8	13.3	24.7e-8	0.491	93.2	40.2	0.00076
SD	2.3094e-9	0.1528	2.3094e-9	2.5166e-3	1.3317	0.1000	8.0000e-5
130	21.8e-8	14.8	27.8e-8	0.499	98.5	36.8	0.00294
	21.1e-8	15.2	26.1e-8	0.432	94.1	36.1	0.00112
	21.2e-8	14.8	26.5e-8	0.465	95.2	36.4	0.00182
Average	21.4e-8	14.9	26.8e-8	0.465	95.9	36.4	0.00196
SD	3.7859e-9	0.2309	8.8882e-9	0.0335	2.2898	0.3512	9.1804e-4





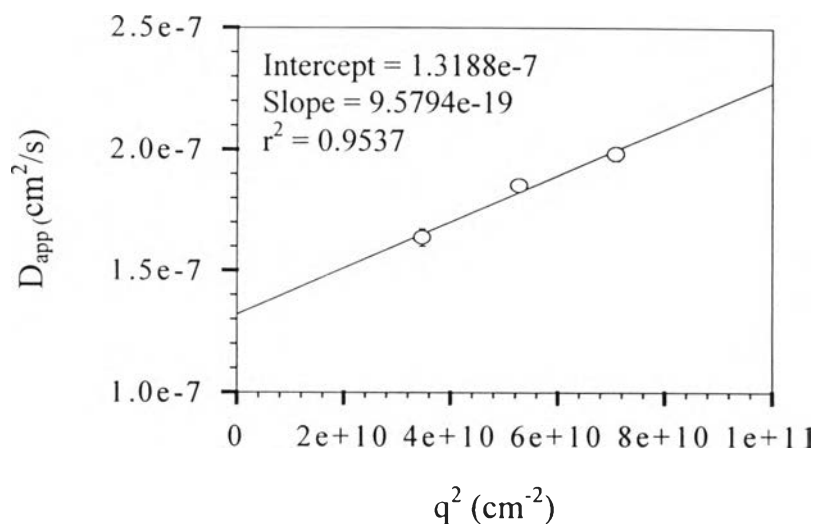
**Figure C6** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 3.42e-3 g/L (0.01 mM).



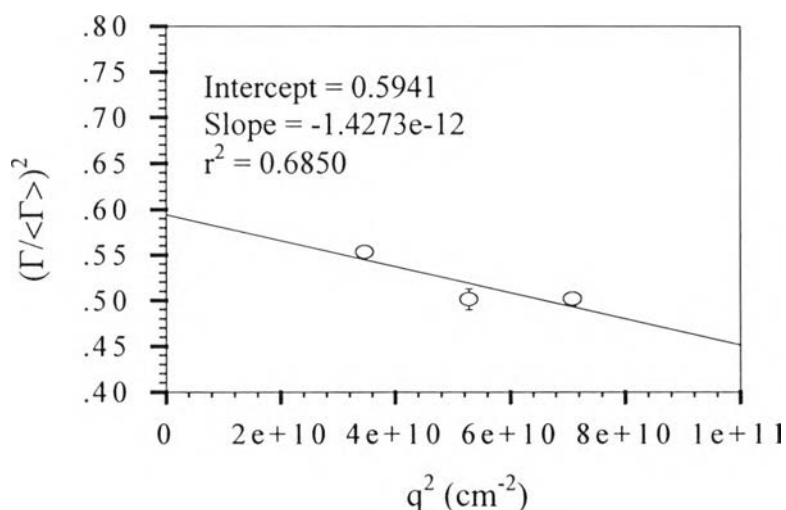
**Figure C7** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 3.42e-3 g/L (0.01 mM).

**Table C9** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 3.42e-2 g/L (0.10 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	16.4e-8	10.7	21.5e-8	0.556	94.3	36.8	0.00135
	16.0e-8	10.4	20.9e-8	0.558	91.7	37.5	0.00138
	16.7e-8	11.0	21.8e-8	0.546	95.1	37.0	0.00145
Average	16.4e-8	10.7	21.4e-8	0.553	93.7	37.1	0.00139
SD	3.5119e-9	0.3000	4.5826e-9	6.4291e-3	1.7776	0.3606	5.1316e-5
90	18.3e-8	12.5	23.2e-8	0.488	92.6	33.2	0.00056
	18.6e-8	12.5	23.7e-8	0.507	91.0	33.9	0.00111
	18.7e-8	12.6	24.0e-8	0.509	96.0	34.7	0.00124
Average	18.5e-8	12.5	23.6e-8	0.501	93.2	33.9	0.00097
SD	2.0817e-9	0.0577	4.0415e-9	0.0116	2.5534	0.7506	3.6097e-4
110	20.0e-8	13.5	25.6e-8	0.508	93.2	35.6	0.00097
	20.0e-8	13.7	25.4e-8	0.493	94.6	34.9	0.00078
	19.5e-8	13.2	24.9e-8	0.504	92.3	34.7	0.00079
Average	19.8e-8	13.5	25.3e-8	0.502	93.4	35.1	0.00085
SD	2.8868e-9	0.2517	3.6056e-9	7.7675e-3	1.1590	0.4726	1.0693e-4



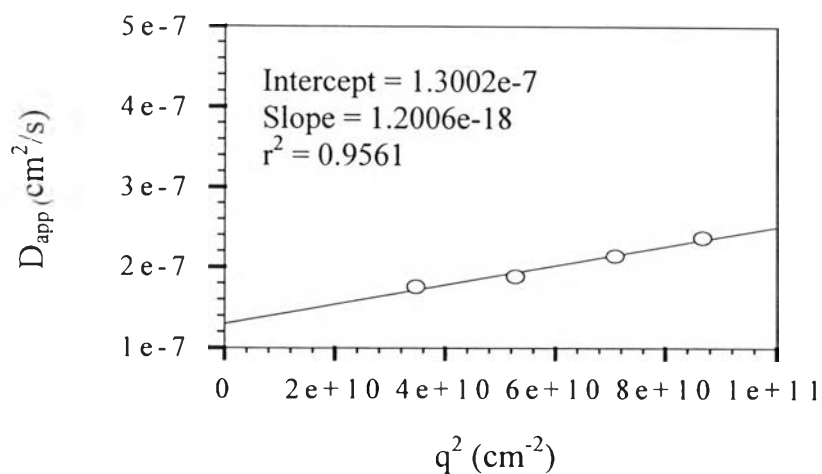
**Figure C8** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 3.42e-2 g/L (0.10 mM).



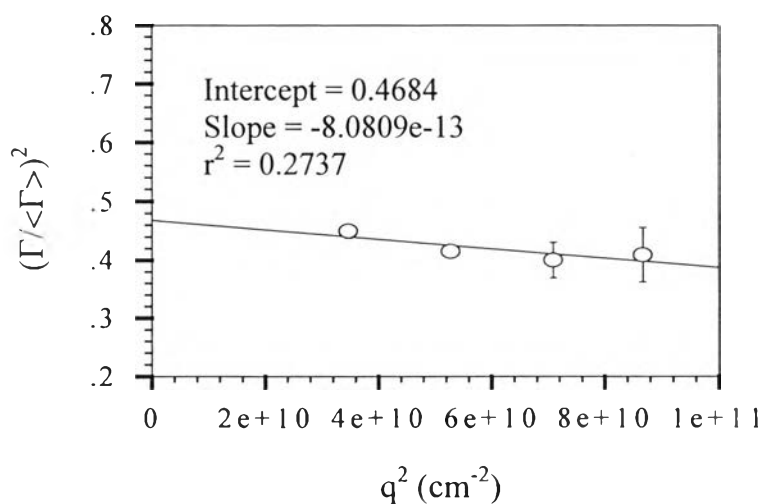
**Figure C9** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 3.42e-2 g/L (0.10 mM).

**Table C10** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 8.55e-2 g/L (0.25 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	17.8e-8	14.2	24.8e-8	0.447	91.7	35.5	0.00051
	17.8e-8	14.1	24.6e-8	0.440	95.2	37.2	0.00078
	17.0e-8	13.9	24.8e-8	0.463	92.6	36.6	0.00072
Average	17.5e-8	14.1	24.7e-8	0.450	93.2	36.4	0.00067
SD	4.6188e-9	0.1528	1.1547e-9	0.0118	1.8175	0.8622	1.4177e-4
90	18.8e-8	15.7	26.8e-8	0.426	93.8	38.7	0.00082
	18.7e-8	15.9	26.5e-8	0.410	95.8	39.0	0.00064
	19.0e-8	16.1	26.9e-8	0.411	97.7	38.9	0.00098
Average	18.8e-8	15.9	26.7e-8	0.416	95.8	38.9	0.00081
SD	1.5275e-9	0.2000	2.0817e-9	8.9629e-3	1.9502	0.1528	1.7010e-4
110	21.6e-8	17.0	28.9e-8	0.424	98.9	38.3	0.00109
	21.0e-8	14.7	25.9e-8	0.450	96.0	39.5	0.00062
	21.6e-8	17.7	27.5e-8	0.366	98.5	37.6	0.00073
Average	21.4e-8	16.5	27.4e-8	0.413	97.8	38.5	0.00081
SD	3.4641e-9	1.5695	1.5011e-8	0.0430	1.5716	0.9609	2.4583e-4
130	24.4e-8	18.9	29.0e-8	0.356	96.3	33.5	0.00070
	23.5e-8	16.7	29.1e-7	0.443	96.0	34.8	0.00065
	23.1e-8	16.6	28.5e-8	0.428	96.6	32.8	0.00095
Average	23.7e-8	17.4	28.9e-8	0.409	96.3	33.7	0.00077
SD	6.6583e-9	1.3000	3.2146e-9	0.0465	0.3000	1.0149	1.6073e-4



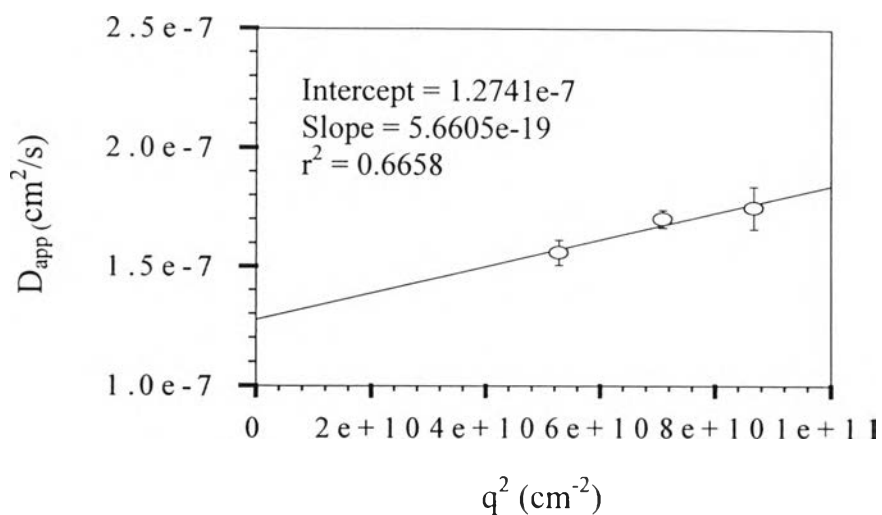
**Figure C10** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 8.55e-2 g/L (0.25 mM).



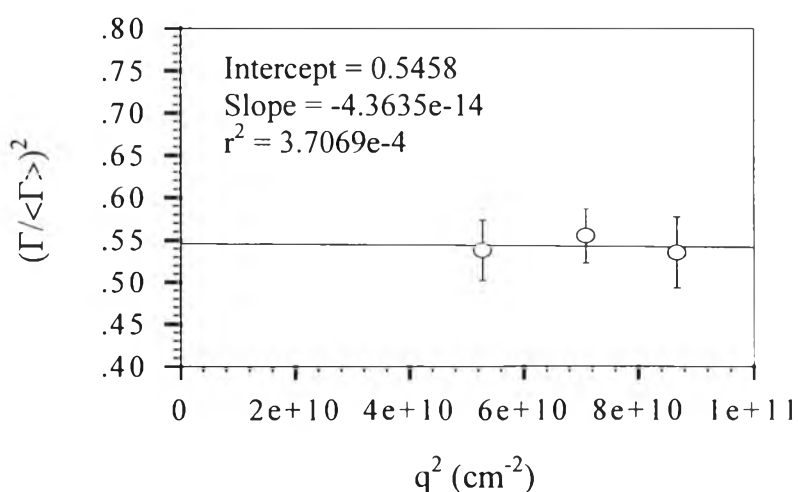
**Figure C11** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 8.55e-2 g/L (0.25 mM).

**Table C11** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 0.14 g/L (0.4 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
90	15.2e-8	9.8	20.1e-8	0.575	88.3	36.4	0.00094
	16.2e-8	10.7	21.0e-8	0.534	90.1	37.3	0.00095
	15.4e-8	10.4	19.7e-8	0.504	85.4	37.7	0.00071
Average	15.6e-8	10.3	20.3e-8	0.538	87.9	37.1	0.00087
SD	5.2915e-9	0.4583	6.6583e-9	0.0356	2.3714	0.6658	1.3577e-4
110	17.3e-8	11.6	22.3e-8	0.519	84.4	18.5	0.00055
	16.6e-8	10.8	21.9e-8	0.566	84.4	20.0	0.00067
	17.2e-8	11.0	22.7e-8	0.581	86.0	19.5	0.00089
Average	17.0e-8	11.1	22.3e-8	0.555	84.9	19.3	0.00070
SD	3.7859e-9	0.4163	4.0000e-9	0.0323	0.9238	0.7638	1.7243e-4
130	17.2e-8	11.2	22.5e-8	0.557	84.0	21.9	0.00091
	18.5e-8	12.7	23.4e-8	0.487	88.6	23.1	0.00072
	16.8e-8	10.9	22.1e-8	0.562	81.4	22.5	0.00081
Average	17.5e-8	11.6	22.7e-8	0.535	84.7	22.5	0.00081
SD	8.8882e-9	0.9644	6.6583e-9	0.0419	3.6460	0.6000	9.5044e-5



**Figure C12** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.14 g/L (0.40 mM).

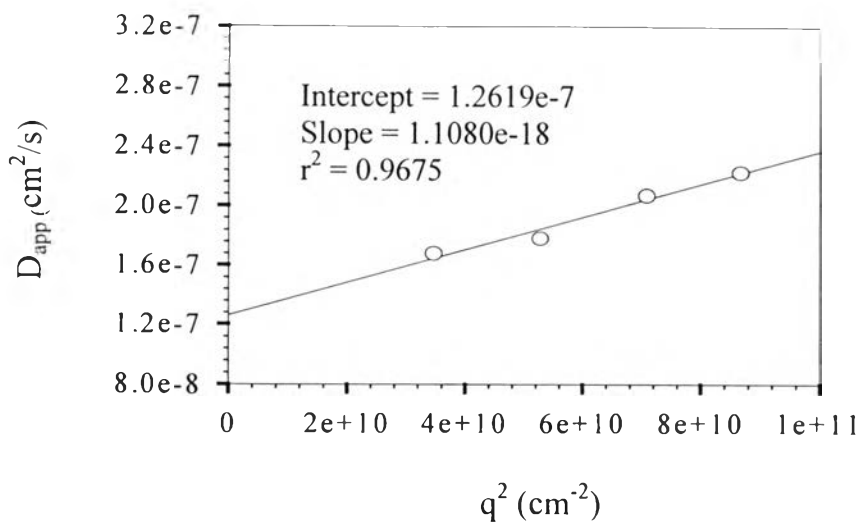


**Figure C13** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.14 g/L (0.40 mM).

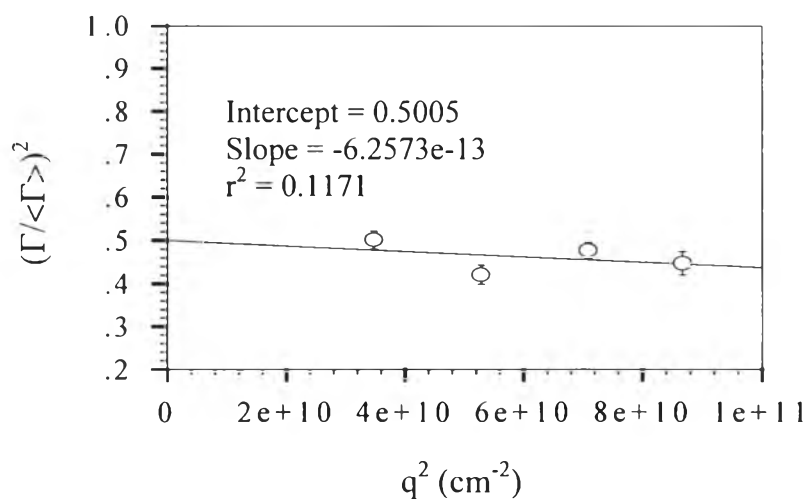
**Table C12** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 0.24 g/L (0.70 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	16.8e-8	13.2	25.7e-8	0.526	90.2	37.5	0.00092
	16.9e-8	14.2	26.2e-8	0.487	92.5	37.3	0.00069
	16.7e-8	14.2	26.4e-8	0.494	93.7	38.4	0.00097
Average	16.8e-8	13.9	26.1e-8	0.502	92.1	37.7	0.00086
SD	1.0000e-9	0.5774	3.6056e-9	0.0208	1.7786	0.5859	1.4933e-4
90	17.7e-8	16.9	27.9e-8	0.403	96.2	32.4	0.00097
	17.9e-8	16.5	28.9e-8	0.446	95.7	32.4	0.00138
	17.9e-8	17.3	29.1e-8	0.415	98.4	32.4	0.00114
Average	17.8e-8	16.9	28.6e-8	0.421	96.7	32.4	0.00116
SD	1.1547e-9	0.4000	6.4291e-9	0.0222	1.4364	0.0000	2.0599e-4
110	20.6e-8	16.3	29.8e-8	0.479	84.4	25.2	0.00105
	20.7e-8	16.6	29.6e-8	0.459	80.5	23.1	0.00079
	20.9e-8	16.3	30.4e-8	0.495	79.9	23.0	0.00121
Average	20.7e-8	16.4	29.9e-8	0.478	81.6	23.8	0.00101
SD	1.5275e-9	0.1732	4.1633e-9	0.0180	2.4434	1.2423	2.1197e-4
130	22.4e-8	17.6	31.9e-8	0.472	96.6	33.8	0.00134
	22.2e-8	17.8	31.4e-8	0.452	97.6	33.0	0.00081
	22.2e-8	18.3	30.8e-8	0.418	96.2	32.20	0.00056
Average	22.3e-8	17.9	31.4e-8	0.447	96.8	33.0	0.00090
SD	1.1547e-9	0.3606	5.5076e-9	0.0273	0.7211	0.8000	3.9829e-4





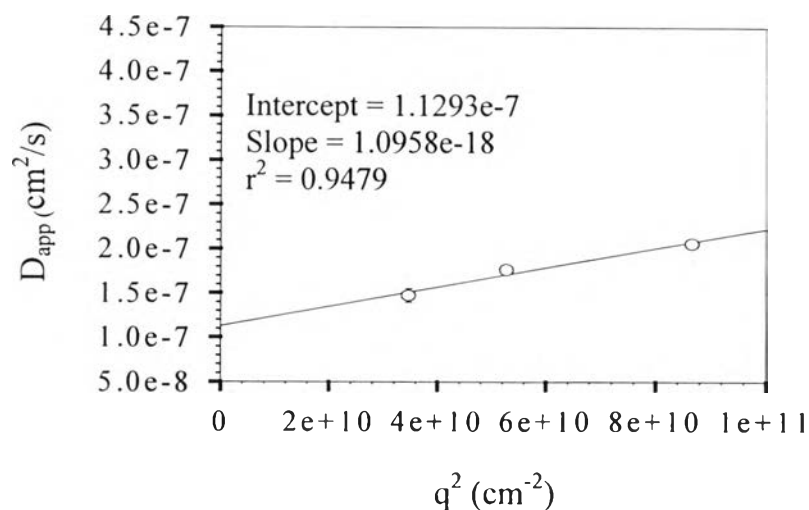
**Figure C14** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.24 g/L (0.70 mM).



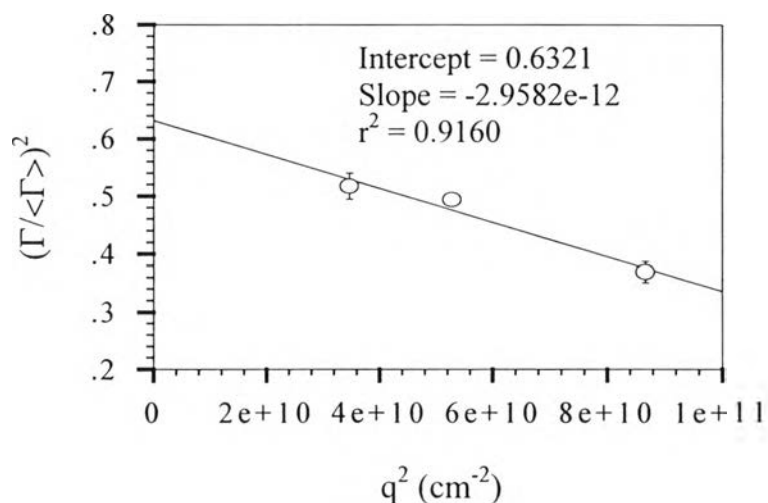
**Figure C15** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.24 g/L (0.70 mM).

**Table C13** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 0.34 g/L (1.00 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,Z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	14.5e-8	9.7	18.7e-8	0.520	90.4	37.9	0.00184
	14.1e-8	9.3	18.3e-8	0.539	87.4	36.8	0.00221
	15.6e-8	10.6	19.9e-8	0.494	89.1	35.5	0.00206
Average	14.7e-8	9.9	19.0e-8	0.518	89.0	36.7	0.00204
SD	7.7675e-9	0.6658	8.3267e-9	0.0226	1.5044	1.2014	1.8610e-4
90	17.9e-8	12.2	22.6e-8	0.487	92.4	20.9	0.00069
	17.5e-8	12.0	22.2e-8	0.491	92.5	22.5	0.00069
	17.5e-8	11.8	22.3e-8	0.504	90.3	24.0	0.00076
Average	17.6e-8	12.0	22.4e-8	0.494	91.7	22.5	0.00071
SD	2.3094e-9	0.2000	2.0817e-9	8.8882e-3	1.2423	1.5503	4.0415e-5
130	20.5e-8	15.9	24.4e-8	0.356	92.4	23.2	0.00042
	20.7e-8	15.5	25.0e-8	0.390	91.9	23.1	0.00040
	20.6e-8	15.8	24.5e-8	0.362	92.1	22.1	0.00047
Average	20.6e-8	15.7	24.6e-8	0.369	92.1	22.8	0.00043
SD	1.0000e-9	0.2082	3.2146e-9	0.0181	0.2517	0.6083	3.6056e-5



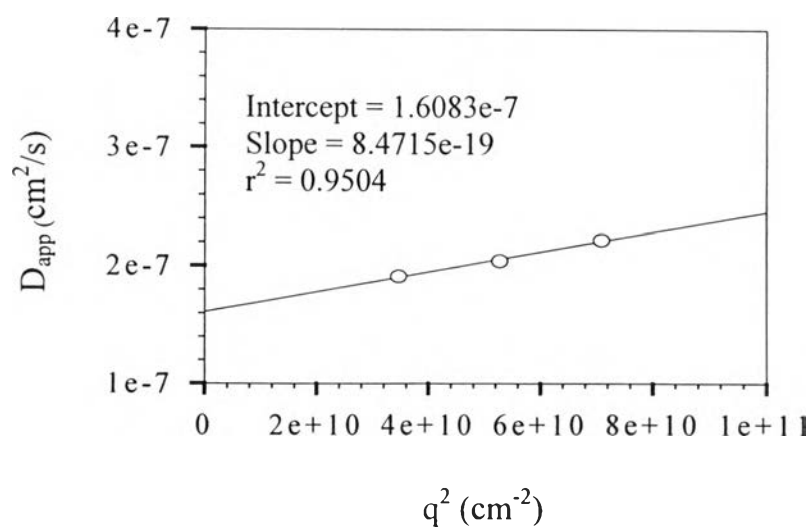
**Figure C16** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 0.26 g/L and 0.34 g/L (1.00 mM).



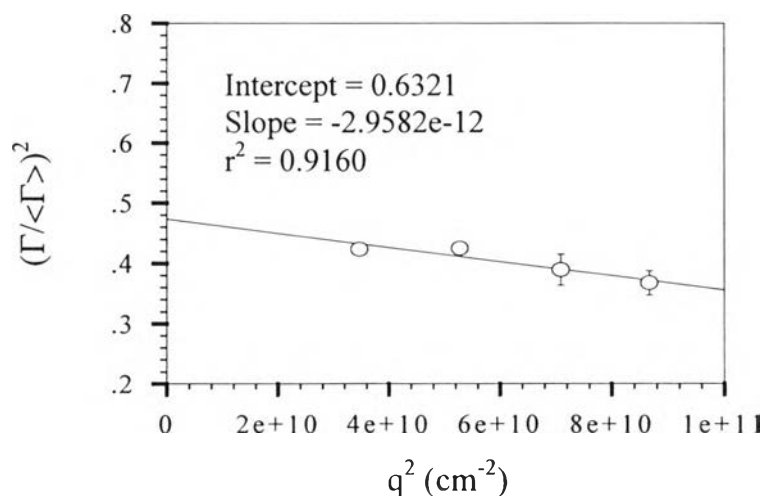
**Figure C17** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.34 g/L (1.00 mM).

**Table C14** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 0.51 g/L (1.50 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	19.6e-8	14.2	24.0e-8	0.421	91.4	37.4	0.00248
	18.9e-8	13.7	23.3e-8	0.425	88.2	36.0	0.00213
	18.8e-8	13.6	23.1e-8	0.425	81.2	34.5	0.00218
Average	19.1e-8	13.8	23.5e-8	0.424	86.9	36.0	0.00226
SD	4.3589e-9	0.3215	4.7258e-9	2.3094e-3	5.2166	1.4503	1.8930e-4
90	20.0e-8	14.5	24.6e-8	0.422	82.3	35.9	0.00052
	20.6e-8	14.9	25.3e-8	0.424	89.9	36.9	0.00055
	20.6e-8	14.8	25.4e-8	0.428	89.7	36.8	0.00067
Average	20.4e-8	14.7	25.1e-8	0.425	87.3	36.5	0.00058
SD	3.4641e-9	0.2082	4.3589e-9	3.0551e-3	4.3313	0.5508	7.9373e-5
110	22.1e-8	16.5	26.7e-8	0.392	95.5	36.7	0.00046
	22.2e-8	17.1	26.4e-8	0.362	96.6	36.9	0.00041
	22.2e-8	16.2	27.2e-8	0.272	97.9	36.9	0.00085
Average	22.2e-8	16.6	26.8e-8	0.342	96.7	36.8	0.00057
SD	5.7735e-10	0.4583	4.0415e-9	0.0624	1.2014	0.1155	2.4090e-4



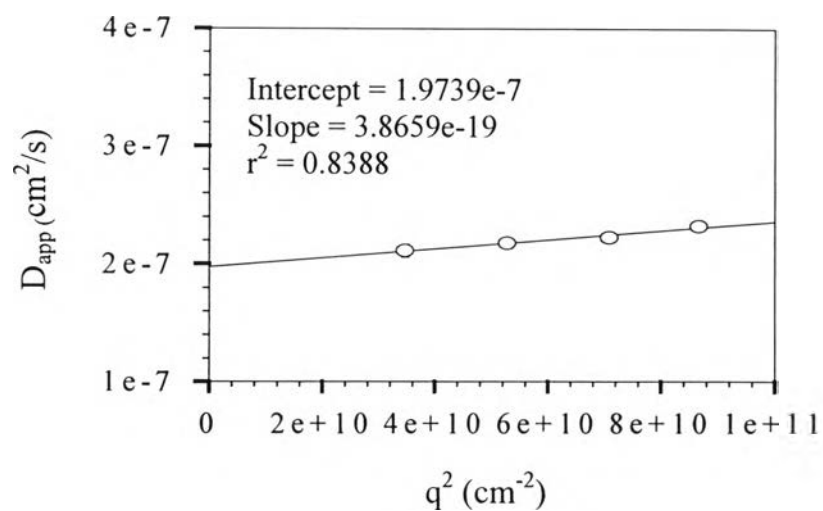
**Figure C18** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.51 g/L (1.50 mM).



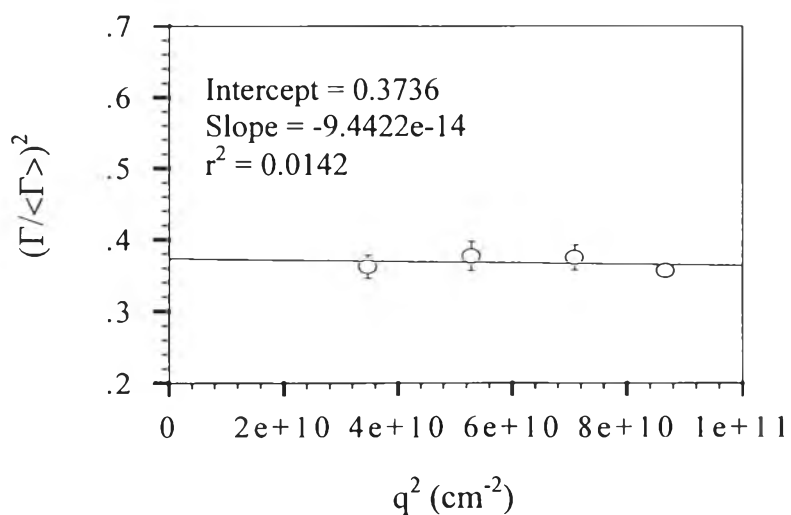
**Figure C19** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.51 g/L (1.50 mM).

**Table C15** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 0.68 g/L (2.0 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	20.5e-8	15.5	24.7e-8	0.379	90.0	37.4	0.00029
	21.4e-8	16.5	25.5e-8	0.361	95.9	37.8	0.00017
	21.5e-8	16.8	25.4e-8	0.347	94.4	37.4	0.00021
Average	21.1e-8	16.3	25.2e-8	0.362	93.4	37.5	0.00022
SD	5.5076e-9	0.6807	4.3589e-9	0.0160	3.0665	0.2309	6.1101e-5
90	21.6e-8	16.0	26.2e-8	0.400	92.9	38.0	0.00066
	21.6e-8	16.6	25.7e-8	0.362	94.8	38.3	0.00048
	22.2e-8	16.9	26.5e-8	0.369	97.0	38.4	0.00045
Average	21.8e-8	16.5	26.1e-8	0.377	94.9	38.2	0.00053
SD	3.4641e-9	0.4583	4.0415e-9	0.0202	2.0518	0.2082	1.1358e-4
110	21.9e-8	16.9	26.1e-8	0.362	90.6	36.9	0.00039
	22.4e-8	17.1	26.8e-8	0.369	95.4	36.9	0.00067
	22.5e-8	16.8	27.3e-8	0.395	97.4	37.1	0.00082
Average	22.3e-8	16.9	26.7e-8	0.375	94.5	37.0	0.00063
SD	3.2146e-9	0.1528	6.0277e-9	0.0174	3.4948	0.1155	2.1825e-4
130	23.4e-8	18.2	27.7e-8	0.352	98.1	35.0	0.00076
	23.2e-8	17.9	27.6e-8	0.359	96.6	35.3	0.00063
	23.1e-8	17.9	27.6e-8	0.359	95.9	35.6	0.00061
Average	23.2e-8	18.0	27.6e-8	0.357	96.9	35.3	0.00067
SD	1.5275e-9	0.1732	5.7735e-10	4.0415e-3	1.1240	0.3000	8.1445e-5



**Figure C20** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.68 g/L (2.0 mM).

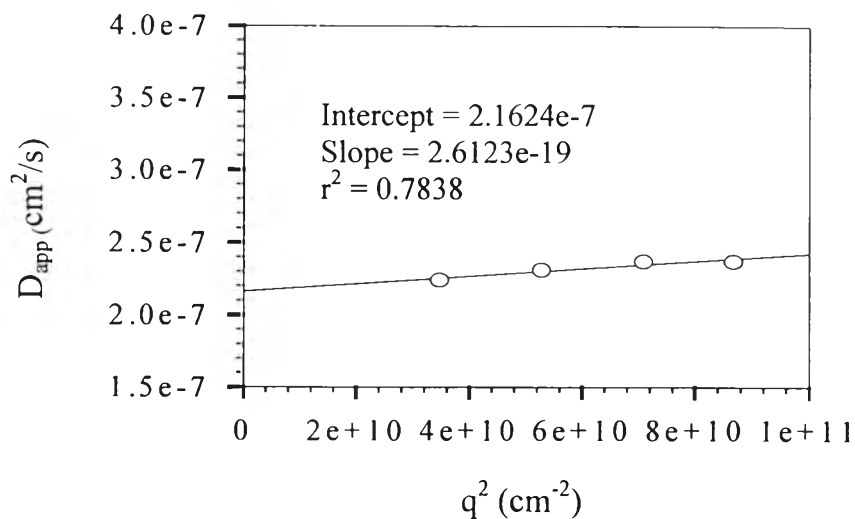


**Figure C21** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 0.68 g/L (2.0 mM).

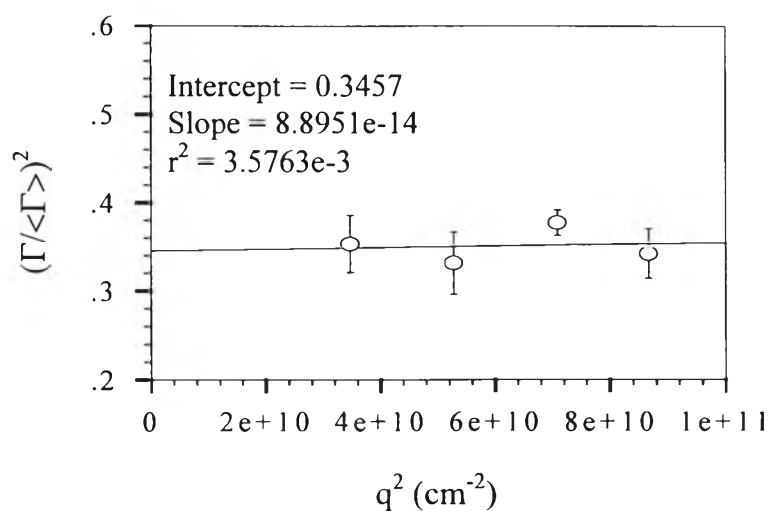
**Table C16** Data for the HPC/CADG/water system at pH 3.0. The HPC and CADG concentration were fixed at 2.6 g/L and 1.03 g/L (3.0 mM).

Angle (degree)	$D_{app,mean}$ ( $cm^2/s$ )	Width	$D_{app,z}$ ( $cm^2/s$ )	Poly dispersity	In Range	Merit	Fit Error
70	22.1e-8	16.6	26.7e-8	0.387	95.8	40.1	0.00091
	22.2e-8	17.3	26.3e-8	0.351	96.3	40.2	0.00052
	22.9e-8	18.5	26.7e-8	0.322	99.1	40.2	0.00044
Average	22.4e-8	17.5	26.6e-8	0.353	97.1	40.2	0.00062
SD	4.3589e-9	0.9609	2.3094e-9	0.0326	1.7786	0.0577	2.5146e-4
90	23.1e-8	19.2	26.7e-8	0.300	95.8	39.8	0.00028
	23.0e-8	17.5	27.5e-8	0.370	95.5	39.3	0.00068
	23.2e-8	18.7	27.2e-8	0.325	98.6	39.5	0.00042
Average	23.1e-8	18.5	27.1e-8	0.332	96.6	39.5	0.00046
SD	1.0000e-9	0.8737	4.0415e-9	0.0355	1.7098	0.2517	2.0298e-4
110	23.8e-8	18.4	28.4e-8	0.361	98.5	37.2	0.00075
	23.5e-8	17.7	28.3e-8	0.384	98.4	37.3	0.00105
	23.8e-8	17.8	28.7e-8	0.387	93.3	36.9	0.00069
Average	23.7e-8	18.0	28.5e-8	0.377	96.7	37.1	0.00083
SD	1.7321e-9	0.3786	2.0817e-9	0.0142	2.9738	0.2082	1.9287e-4
130	23.6e-8	18.0	27.7e-8	0.339	90.9	24.7	0.00068
	23.9e-8	19.5	27.9e-8	0.316	95.7	25.9	0.00047
	23.6e-8	18.0	2.83e-8	0.372	95.0	27.9	0.00080
Average	23.7e-8	18.5	2.80e-8	0.342	93.9	26.2	0.00065
SD	1.7321e-9	0.8660	3.0551e-9	0.0281	2.5929	1.6166	1.6703e-4





**Figure C22** The apparent diffusion coefficient as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 1.03 g/L (3.0 mM).



**Figure C23** Polydispersity as a function of the scattering wave vector at 30°C for the HPC/water system at pH 3.0. The HPC concentration and the CADG concentration were fixed at 2.6 g/L and 1.03 g/L (3.0 mM).

**Table C17** Data for the center of mass diffusion coefficient ( $D_c$ ), the hydrodynamic radius ( $R_h$ ) and the polydispersity  $(\Gamma/\langle\Gamma\rangle)^2$  as a function of CADG concentration at 30°C for HPC/CADG/water system at pH 3.0. The HPC concentration was fixed at 2.6 g/L (Figure 4.13 and Figure 4.15).

[CADG] (g/L)	[CADG] (mM)	$D_c$ (cm <sup>2</sup> /s)	$R_h$ (nm)	$(\Gamma/\langle\Gamma\rangle)^2$
3.42e-5	1.00e-4	1.2795e-7	21.6	0.5983
3.42e-4	1.00e-3	1.2880e-7	21.5	0.6085
3.42e-3	0.01	1.2693e-7	21.8	0.5985
3.42e-2	0.10	1.3188e-7	21.0	0.5941
8.55e-2	0.25	1.3002e-7	21.3	0.4684
0.14	0.40	1.2741e-7	21.7	0.5458
0.24	0.70	1.2619e-7	22.0	0.5005
0.34	1.00	1.1293e-7	24.5	0.6321
0.51	1.50	1.6083e-7	17.2	0.4731
0.68	2.00	1.9739e-7	14.0	0.3736
1.03	3.00	2.1624e-7	12.8	0.3457

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