

Supplementary Material

Study on Volumetric, Compressibility and Viscometric Behaviour of Cationic Surfactants (CTAB and DTAB) in Aqueous Glycyl dipeptide: Thermo-acoustic Approach

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Table S1: Density, ρ ($\text{kg}\cdot\text{m}^{-3}$) values for CTAB and DTAB in pure water and 0.001, 0.005 and 0.010 $\text{mol}\cdot\text{kg}^{-1}$ aqueous solution of glycyl dipeptide at different temperatures.

CTAB						DTAB					
[CTAB] $\text{mmol}\cdot\text{kg}^{-1}$	293.15 K	298.15 K	303.15 K	308.15 K	313.15 K	[DTAB] $\text{mmol}\cdot\text{kg}^{-1}$	293.15 K	298.15 K	303.15 K	308.15 K	313.15 K
[Pure Water]											
0.2	998.39	997.23	995.83	994.21	992.37	3	998.31	997.20	995.71	994.26	992.29
0.4	998.39	997.23	995.83	994.22	992.40	6	998.37	997.26	995.76	994.31	992.33
0.6	998.40	997.24	995.84	994.23	992.40	9	998.43	997.32	995.82	994.36	992.38
0.8	998.41	997.25	995.85	994.23	992.41	12	998.49	997.37	995.87	994.41	992.42
1.0	998.41	997.25	995.85	994.23	992.41	15	998.54	997.43	995.92	994.46	992.47
1.2	998.41	997.25	995.85	994.23	992.42	18	998.60	997.49	995.97	994.51	992.51
1.4	998.41	997.25	995.86	994.24	992.42	21	998.65	997.53	996.02	994.55	992.55
1.6	998.42	997.26	995.86	994.24	992.42	24	998.70	997.58	996.07	994.59	992.59
1.8	998.42	997.26	995.86	994.24	992.43	27	998.75	997.63	996.11	994.63	992.63
2.0	998.43	997.26	995.87	994.25	992.43	30	998.81	997.67	996.16	994.67	992.67
[Glycyl Dipeptide] = 0.001 $\text{mol}\cdot\text{kg}^{-1}$											
0.2	997.03	996.10	994.63	992.30	990.81	3	998.87	997.78	996.32	994.56	992.80
0.4	997.11	996.12	994.65	992.32	990.82	6	998.88	997.79	996.30	994.53	992.82
0.6	997.24	996.13	994.67	992.34	990.84	9	998.88	997.69	996.25	994.57	992.85
0.8	997.36	996.15	994.69	992.36	990.86	12	998.89	997.72	996.36	994.64	992.90
1.0	997.45	996.16	994.71	992.37	990.88	15	998.96	997.76	996.41	994.71	992.95
1.2	997.53	996.18	994.72	992.38	990.91	18	999.00	997.81	996.46	994.75	993.00
1.4	997.58	996.19	994.74	992.40	990.94	21	999.16	997.88	996.51	994.75	993.03
1.6	997.62	996.20	994.75	992.42	990.95	24	999.20	998.00	996.56	994.82	993.07
1.8	997.69	996.21	994.76	992.43	990.97	27	999.35	998.00	996.60	994.87	993.10

2.0	997.70	996.22	994.78	992.44	990.98	30	999.39	998.03	996.65	994.89	993.15
[Glycyl Dipeptide] = 0.005 mol·kg⁻¹											
0.2	997.63	996.33	994.83	992.84	990.78	3	998.91	997.80	996.35	994.70	992.89
0.4	997.65	996.35	994.85	992.86	990.79	6	998.92	997.81	996.36	994.72	992.90
0.6	997.66	996.38	994.86	992.87	990.80	9	998.93	997.83	996.42	994.79	992.94
0.8	997.67	996.41	994.88	992.89	990.81	12	999.02	997.89	996.48	994.84	993.00
1.0	997.68	996.43	994.91	992.90	990.81	15	999.10	997.96	996.53	994.89	993.05
1.2	997.69	996.46	994.93	992.91	990.81	18	999.19	998.01	996.58	994.94	993.10
1.4	997.71	996.47	994.95	992.92	990.82	21	999.25	998.06	996.62	994.98	993.13
1.6	997.72	996.48	994.97	992.92	990.82	24	999.31	998.10	996.67	995.02	993.17
1.8	997.73	996.49	994.99	992.93	990.82	27	999.35	998.14	996.71	995.07	993.20
2.0	997.74	996.50	995.00	992.94	990.83	30	999.40	998.18	996.74	995.10	993.23
[Glycyl Dipeptide] = 0.010 mol·kg⁻¹											
0.2	998.81	997.51	995.02	993.50	991.08	3	998.99	997.75	996.30	994.74	992.94
0.4	998.83	997.52	995.03	993.52	991.11	6	999.08	997.81	996.41	994.80	992.98
0.6	998.84	997.53	995.04	993.52	991.16	9	999.14	997.88	996.48	994.84	993.03
0.8	998.85	997.55	995.05	993.52	991.21	12	999.21	997.94	996.53	994.89	993.08
1.0	998.86	997.56	995.06	993.52	991.26	15	999.24	998.01	996.59	994.95	993.12
1.2	998.88	997.58	995.07	993.53	991.31	18	999.30	998.06	996.63	994.99	993.16
1.4	998.89	997.59	995.09	993.53	991.35	21	999.33	998.12	996.67	995.04	993.21
1.6	998.90	997.59	995.10	993.53	991.39	24	999.38	998.16	996.72	995.07	993.24
1.8	998.91	997.60	995.11	993.53	991.43	27	999.40	998.20	996.75	995.11	993.29
2.0	998.92	997.60	995.11	993.54	991.49	30	999.47	998.25	996.80	995.16	993.32

Table S2: Speed of sound, u ($\text{m}\cdot\text{s}^{-1}$) values for CTAB and DTAB in pure water and 0.001, 0.005 and 0.010 $\text{mol}\cdot\text{kg}^{-1}$ aqueous solution of glycyl dipeptide at different temperatures.

CTAB						DTAB					
[CTAB] $\text{mmol}\cdot\text{kg}^{-1}$	293.15 K	298.15 K	303.15 K	308.15 K	313.15 K	[DTAB] $\text{mmol}\cdot\text{kg}^{-1}$	293.15 K	298.15 K	303.15 K	308.15 K	313.15 K
[Pure water]											
0.2	1482.40	1496.49	1509.18	1519.73	1528.84	3	1483.30	1497.20	1509.70	1520.30	1529.40
0.4	1482.54	1496.61	1509.26	1519.80	1528.91	6	1484.20	1497.90	1510.30	1520.90	1529.90
0.6	1482.70	1496.79	1509.33	1519.87	1528.99	9	1484.90	1498.60	1511.00	1521.50	1530.40
0.8	1482.81	1496.90	1509.43	1519.94	1529.07	12	1485.60	1499.20	1511.60	1522.00	1530.90
1.0	1482.99	1496.99	1509.47	1519.99	1529.13	15	1486.30	1499.90	1512.00	1522.60	1531.40
1.2	1483.07	1497.06	1509.51	1520.03	1529.16	18	1486.70	1500.20	1512.20	1522.60	1531.50
1.4	1483.15	1497.13	1509.55	1520.07	1529.20	21	1486.80	1500.30	1512.20	1522.60	1531.40
1.6	1483.23	1497.19	1509.59	1520.10	1529.23	24	1486.90	1500.30	1512.20	1522.60	1531.40
1.8	1483.29	1497.23	1509.62	1520.14	1529.26	27	1487.00	1500.40	1512.20	1522.60	1531.30
2.0	1483.38	1497.31	1509.66	1520.17	1529.30	30	1487.00	1500.40	1512.20	1522.50	1531.30
[Glycyl Dipeptide] = 0.001 $\text{mol}\cdot\text{kg}^{-1}$											
0.2	1497.22	1509.52	1520.13	1528.14	1536.32	3	1484.45	1498.36	1510.52	1521.27	1529.96
0.4	1497.29	1509.64	1520.22	1528.19	1536.37	6	1484.93	1498.81	1511.01	1521.51	1530.34
0.6	1497.35	1509.73	1520.28	1528.22	1536.42	9	1485.65	1499.52	1511.62	1521.98	1530.94
0.8	1497.43	1509.79	1520.32	1528.24	1536.45	12	1486.47	1500.21	1512.12	1522.52	1531.45
1.0	1497.49	1509.89	1520.36	1528.27	1536.47	15	1487.06	1500.82	1512.65	1522.93	1531.89
1.2	1497.55	1509.96	1520.40	1528.29	1536.49	18	1487.36	1501.12	1512.92	1523.21	1532.15
1.4	1497.61	1509.99	1520.43	1528.31	1536.51	21	1487.58	1501.22	1513.07	1523.38	1532.42
1.6	1497.67	1510.05	1520.46	1528.33	1536.53	24	1487.69	1501.34	1513.11	1523.41	1532.54
1.8	1497.72	1510.11	1520.49	1528.35	1536.55	27	1487.86	1501.39	1513.15	1523.46	1532.59

2.0	1497.79	1510.16	1520.51	1528.37	1536.57	30	1487.98	1501.43	1513.20	1523.53	1532.61
[Glycyl Dipeptide] = 0.005 mol·kg⁻¹											
0.2	1498.06	1510.19	1521.43	1529.82	1537.36	3	1484.71	1498.57	1510.61	1521.41	1530.29
0.4	1498.16	1510.23	1521.52	1529.88	1537.44	6	1485.19	1499.05	1511.01	1521.68	1530.88
0.6	1498.22	1510.29	1521.63	1529.95	1537.49	9	1485.92	1499.76	1511.69	1522.32	1531.42
0.8	1498.32	1510.36	1521.67	1530.01	1537.56	12	1486.67	1500.43	1512.19	1522.89	1531.82
1.0	1498.44	1510.40	1521.73	1530.09	1537.61	15	1487.19	1500.91	1512.67	1523.39	1532.15
1.2	1498.51	1510.44	1521.79	1530.16	1537.68	18	1487.45	1501.16	1512.96	1523.59	1532.43
1.4	1498.62	1510.49	1521.86	1530.21	1537.75	21	1487.61	1501.27	1513.17	1523.63	1532.53
1.6	1498.51	1510.52	1521.92	1530.27	1537.81	24	1487.73	1501.39	1513.26	1523.68	1532.58
1.8	1498.62	1510.57	1521.96	1530.33	1537.87	27	1487.91	1501.45	1513.31	1523.72	1532.62
2.0	1498.71	1510.60	1521.96	1530.36	1537.96	30	1488.02	1501.52	1513.39	1523.77	1532.65
[Glycyl Dipeptide] = 0.010 mol·kg⁻¹											
0.2	1499.27	1511.13	1522.03	1531.75	1539.36	3	1484.99	1498.61	1510.69	1521.51	1530.33
0.4	1499.31	1511.17	1522.08	1531.80	1539.42	6	1485.32	1499.35	1511.31	1522.09	1530.95
0.6	1499.35	1511.22	1522.13	1531.85	1539.48	9	1486.03	1500.01	1511.92	1522.69	1531.51
0.8	1499.38	1511.26	1522.17	1531.89	1539.53	12	1486.83	1500.56	1512.55	1523.22	1532.06
1.0	1499.41	1511.29	1522.20	1531.92	1539.57	15	1487.28	1501.04	1512.99	1523.63	1532.36
1.2	1499.43	1511.31	1522.23	1531.94	1539.60	18	1487.54	1501.28	1513.18	1523.76	1532.61
1.4	1499.45	1511.33	1522.25	1531.96	1539.62	21	1487.68	1501.38	1513.29	1523.92	1532.68
1.6	1499.47	1511.34	1522.26	1531.98	1539.64	24	1487.76	1501.47	1513.36	1524.05	1532.72
1.8	1499.49	1511.35	1522.28	1532.00	1539.66	27	1487.95	1501.54	1513.43	1524.16	1532.78
2.0	1499.50	1511.36	1522.30	1532.01	1539.68	30	1488.09	1501.62	1513.49	1523.96	1532.77

Table S3: Viscosity, η (mPa·s) values for CTAB and DTAB in pure water and 0.001, 0.005 and 0.010 mol·kg⁻¹ aqueous solution of glycyl dipeptide at different temperatures.

CTAB						DTAB					
[CTAB] mmol·kg ⁻¹	293.15 K	298.15 K	303.15 K	308.15 K	313.15 K	[DTAB] mmol·kg ⁻¹	293.15 K	298.15 K	303.15 K	308.15 K	313.15 K
[Pure Water]											
0.2	1.006	0.895	0.803	0.726	0.618	3	1.004	0.893	0.801	0.724	0.617
0.4	1.011	0.899	0.807	0.730	0.623	6	1.006	0.896	0.804	0.727	0.620
0.6	1.016	0.904	0.811	0.734	0.626	9	1.008	0.899	0.807	0.729	0.622
0.8	1.020	0.908	0.815	0.738	0.630	12	1.010	0.901	0.809	0.732	0.624
1.0	1.025	0.913	0.819	0.742	0.633	15	1.012	0.903	0.810	0.734	0.626
1.2	1.030	0.917	0.823	0.746	0.637	18	1.014	0.905	0.813	0.736	0.628
1.4	1.034	0.921	0.827	0.750	0.640	21	1.017	0.908	0.815	0.738	0.630
1.6	1.038	0.925	0.831	0.753	0.643	24	1.021	0.911	0.818	0.741	0.632
1.8	1.043	0.930	0.834	0.757	0.646	27	1.023	0.913	0.820	0.743	0.634
2.0	1.048	0.934	0.839	0.760	0.649	30	1.027	0.917	0.823	0.746	0.637
[Glycyl Dipeptide] = 0.001 mol·kg ⁻¹											
0.20	1.425	1.271	1.130	1.076	0.923	3	1.181	1.090	1.063	1.044	0.967
0.40	1.445	1.286	1.145	1.093	0.936	6	1.188	1.097	1.068	1.047	0.971
0.60	1.460	1.300	1.165	1.110	0.953	9	1.197	1.128	1.073	1.054	0.975
0.80	1.476	1.319	1.182	1.125	0.967	12	1.204	1.111	1.079	1.060	0.979
0.10	1.495	1.339	1.200	1.145	0.985	15	1.211	1.118	1.082	1.064	0.984
1.20	1.510	1.350	1.220	1.162	1.001	18	1.217	1.126	1.087	1.070	0.989
1.40	1.524	1.363	1.239	1.177	1.016	21	1.227	1.134	1.093	1.072	0.995
1.60	1.536	1.379	1.257	1.194	1.029	24	1.232	1.141	1.096	1.076	0.997
1.80	1.547	1.400	1.272	1.212	1.042	27	1.239	1.146	1.101	1.078	1.002

2.00	1.564	1.420	1.289	1.233	1.061	30	1.245	1.154	1.105	1.080	1.004
[Glycyl Dipeptide] = 0.005 mol·kg⁻¹											
0.20	1.459	1.295	1.158	1.106	0.949	3	1.210	1.117	1.095	1.068	0.988
0.40	1.471	1.312	1.176	1.122	0.964	6	1.220	1.125	1.102	1.074	0.995
0.60	1.485	1.326	1.191	1.139	0.984	9	1.223	1.132	1.107	1.081	1.001
0.80	1.498	1.343	1.209	1.153	1.001	12	1.229	1.140	1.111	1.085	1.005
0.10	1.513	1.358	1.224	1.172	1.015	15	1.235	1.147	1.117	1.090	1.010
1.20	1.530	1.372	1.239	1.187	1.029	18	1.242	1.154	1.121	1.092	1.013
1.40	1.545	1.386	1.258	1.209	1.047	21	1.249	1.161	1.127	1.096	1.017
1.60	1.556	1.403	1.273	1.223	1.060	24	1.258	1.167	1.132	1.099	1.021
1.80	1.577	1.421	1.290	1.241	1.074	27	1.266	1.175	1.138	1.101	1.027
2.00	1.594	1.439	1.318	1.255	1.090	30	1.270	1.182	1.140	1.104	1.029
[Glycyl Dipeptide] = 0.010 mol·kg⁻¹											
0.20	1.474	1.317	1.182	1.131	0.979	3	1.241	1.165	1.148	1.080	1.005
0.40	1.488	1.334	1.206	1.145	0.992	6	1.256	1.175	1.156	1.089	1.013
0.60	1.508	1.346	1.225	1.162	1.005	9	1.270	1.183	1.164	1.096	1.019
0.80	1.530	1.363	1.246	1.176	1.022	12	1.280	1.191	1.171	1.102	1.025
0.10	1.543	1.381	1.274	1.193	1.035	15	1.288	1.196	1.178	1.108	1.031
1.20	1.559	1.398	1.294	1.211	1.042	18	1.302	1.205	1.185	1.116	1.037
1.40	1.575	1.416	1.312	1.224	1.056	21	1.306	1.213	1.191	1.120	1.041
1.60	1.593	1.433	1.332	1.238	1.069	24	1.310	1.217	1.198	1.126	1.047
1.80	1.610	1.447	1.353	1.252	1.082	27	1.314	1.220	1.205	1.132	1.051
2.00	1.624	1.459	1.371	1.266	1.096	30	1.321	1.225	1.212	1.135	1.057