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## APPENDICES

### Appendix A Mechanical properties

**Table 1** Impact strength of different molecular weight PCL

<b>M<sub>w</sub></b>	<b>Impact strength (kJ/m<sup>2</sup>)</b>					<b>Average</b>	<b>SD</b>
<b>95800</b>	15.8	14.8	16.7	15.7	16.2	15.8	0.70
<b>43600</b>	3.4	3.5	3.7	3.2	2.9	3.3	0.30
<b>32700</b>	2.8	2.7	2.7	2.6	2.8	2.7	0.08
<b>24700</b>	1.9	1.5	1.5	1.6	1.7	1.6	0.17
<b>17000</b>	1.5	1.3	1.3	1.4	1.3	1.4	0.09

**Table 2** Impact strength of PCL nanoclay nanocomposites

<b>Wt% of organoclay</b>	<b>Impact strength (kJ/m<sup>2</sup>)</b>					<b>Average</b>	<b>SD</b>
<b>0</b>	10.8	11.3	10.2	10.1	10.8	10.6	0.49
<b>1</b>	10.3	9.1	10.3	9.1	10.1	9.8	0.63
<b>3</b>	7.5	8.5	8.3	9.0	8.0	8.2	0.56
<b>5</b>	7.1	7.2	7.2	7.1	7.6	7.2	0.21
<b>7</b>	7.4	7.9	7.0	6.5	6.5	7.1	0.60

**Table 3** Impact strength of EVA-g-PCL

<b>Samples</b>	<b>Impact strength (kJ/m<sup>2</sup>)</b>					<b>Average</b>	<b>SD</b>
<b>EVA-g-PCL 1:1</b>	-	-	-	-	-	-	-
<b>EVA-g-PCL 1:5</b>	31.4	35.3	31.4	38	34.2	34.1	2.79
<b>EVA-g-PCL 1:10</b>	15.7	18.4	18.6	19.8	17.6	18.0	1.52
<b>PCL</b>	15.8	14.8	16.7	15.7	16.2	15.8	0.70

**Table 4** Tensile properties of different molecular weight PCL

$M_w$	Young's modulus (MPa)				Average	SD
95800	161.69	191.98	186.08	208.24	187.00	19.30
43600	172.54	167.46	167.20	170.36	169.39	2.54
32700	239.39	158.75	190.74	229.13	204.50	37.00
24700	130.54	180.51	130.22	-	147.09	28.94

$M_w$	Tensile strength (MPa)				Average	SD
95800	19.84	18.30	18.61	-	18.92	0.81
43600	18.86	18.82	19.49	-	19.06	0.38
32700	10.48	11.53	13.21	-	11.74	1.38
24700	2.29	3.17	2.29	-	2.58	0.51

$M_w$	%elongation at break				Average	SD
95800	23.33	16.64	36.67	36.67	28.33	10.01
43600	13.27	13.27	13.27	13.27	13.27	0
32700	6.28	6.31	6.31	6.31	6.30	0.01
24700	1.76	1.76	1.76	-	1.76	0

**Table 5** Tensile properties of PCL nanoclay nanocomposites

Wt% of organoclay	Young's modulus (MPa)					Average	SD
0	124.70	129.60	128.10	122.70	126.90	126.40	2.74
1	133.00	135.30	135.60	129.80	129.80	132.70	2.83
3	139.10	143.50	143.80	137.20	143.10	141.34	3.00
5	147.10	147.00	145.30	145.50	144.60	145.90	1.10
7	145.90	145.40	152.50	149.50	147.10	148.08	2.93

Wt% of organoclay	Maximum strength (MPa)					Average	SD
0	18.25	18.15	17.79	18.22	18.75	18.23	0.34
1	17.88	18.19	18.69	18.41	17.96	18.23	0.33
3	17.97	18.77	18.58	18.13	18.57	18.40	0.34
5	18.38	17.93	18.21	18.33	18.29	18.23	0.18
7	17.42	17.63	17.38	17.54	17.12	17.42	0.19

**Table 6** Tensile properties of EVA-g-PCL

Samples	Young's modulus (MPa)					Average	SD
EVA-g-PCL 1:1	4.70	4.45	4.02	5.07	3.83	4.41	0.50
EVA-g-PCL 1:5	152.79	146.73	144.48	150.29	142.71	147.40	4.13
EVA-g-PCL 1:10	107.64	125.00	120.69	102.43	114.58	114.07	9.22
PCL	124.70	129.60	128.10	122.70	126.90	126.40	2.74

Samples	Tensile strength (MPa)					Average	SD
*EVA-g-PCL 1:1	2.16	2.30	2.35	2.34	2.28	2.28	0.07
EVA-g-PCL 1:5	9.27	8.94	8.77	9.20	8.70	8.98	0.25
EVA-g-PCL 1:10	6.07	8.87	7.50	6.03	5.78	6.85	0.34
PCL	18.25	18.15	17.79	18.22	18.75	18.23	0.34

\* observed at 500% elongation

Samples	%elongation at break					Average	SD
EVA-g-PCL 1:1	-	-	-	-	-	-	-
EVA-g-PCL 1:5	6.30	6.29	6.30	6.30	6.29	6.30	0
EVA-g-PCL 1:10	6.29	6.29	6.30	6.29	6.29	6.30	0
PCL	23.33	16.64	36.67	36.67	-	28.24	10.01

## Appendix B Dynamic mechanical properties

Table 7 DMA of PCL  $M_w$  95800

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.15	2870.40	71.48	0.025
-118.15	2888.86	68.13	0.024
-117.15	2901.30	64.89	0.022
-116.15	2913.80	61.77	0.021
-115.15	2920.28	59.61	0.020
-114.15	2925.81	58.27	0.020
-113.15	2928.49	56.57	0.019
-112.15	2930.08	55.55	0.019
-111.15	2929.97	54.91	0.019
-110.15	2927.84	54.41	0.019
-109.15	2925.49	54.15	0.019
-108.15	2922.04	54.11	0.019
-107.15	2916.34	54.19	0.019
-106.15	2909.20	54.35	0.019
-105.15	2904.71	54.56	0.019
-104.15	2894.42	55.25	0.019
-103.15	2884.23	56.10	0.019
-102.15	2877.82	57.23	0.020
-101.15	2866.93	59.12	0.021
-100.15	2856.20	61.01	0.021
-99.15	2843.98	63.26	0.022
-98.15	2831.91	65.00	0.023
-97.15	2821.14	66.54	0.024
-96.77	2820.14	66.99	0.024
-96.27	2817.60	66.92	0.024
-95.77	2814.80	66.84	0.024
-95.27	2811.49	66.75	0.024
-94.77	2808.37	66.66	0.024
-94.27	2804.48	66.51	0.024
-93.77	2800.16	66.29	0.024
-93.27	2796.18	66.05	0.024
-92.77	2793.47	65.88	0.024
-92.27	2788.19	65.52	0.023
-91.77	2783.19	65.18	0.023
-91.27	2777.48	64.79	0.023
-90.77	2772.41	64.44	0.023
-90.27	2766.46	64.01	0.023
-89.77	2762.30	63.70	0.023

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-89.27	2755.46	63.20	0.023
-88.77	2748.54	62.73	0.023
-88.27	2741.26	62.26	0.023
-87.77	2734.83	61.84	0.023
-87.27	2728.30	61.39	0.022
-86.77	2723.36	61.03	0.022
-86.27	2716.07	60.51	0.022
-85.77	2708.54	59.98	0.022
-85.27	2701.60	59.51	0.022
-84.77	2694.71	59.05	0.022
-84.27	2687.52	58.61	0.022
-83.77	2682.33	58.31	0.022
-83.27	2673.61	57.82	0.022
-82.77	2665.52	57.37	0.022
-82.27	2657.92	56.95	0.021
-81.77	2650.74	56.55	0.021
-81.27	2642.52	56.13	0.021
-80.77	2636.44	55.84	0.021
-80.27	2627.76	55.47	0.021
-79.77	2619.57	55.13	0.021
-79.27	2611.70	54.81	0.021
-78.77	2603.84	54.52	0.021
-78.27	2596.63	54.32	0.021
-77.77	2590.01	54.19	0.021
-77.27	2581.53	54.12	0.021
-76.77	2573.23	54.15	0.021
-76.27	2565.00	54.28	0.021
-75.77	2556.58	54.46	0.021
-75.27	2550.11	54.61	0.021
-74.77	2542.01	54.78	0.022
-74.27	2532.61	54.98	0.022
-73.77	2523.50	55.20	0.022
-73.27	2514.23	55.51	0.022
-72.77	2504.88	55.92	0.022
-72.27	2498.92	56.26	0.023
-71.77	2489.62	56.93	0.023
-71.27	2479.71	57.85	0.023
-70.77	2470.24	58.90	0.024
-70.27	2458.68	60.34	0.025
-69.77	2448.35	61.71	0.025
-69.27	2436.54	63.34	0.026



Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-68.77	2423.76	65.18	0.027
-68.27	2409.65	67.33	0.028
-67.77	2393.45	69.95	0.029
-67.27	2377.24	72.72	0.031
-66.77	2364.57	74.96	0.032
-66.27	2346.17	78.32	0.033
-65.77	2329.77	81.34	0.035
-65.27	2319.79	83.16	0.036
-64.77	2309.87	84.96	0.037
-64.27	2301.09	86.52	0.038
-63.77	2293.05	87.94	0.038
-63.27	2283.69	89.57	0.039
-62.77	2272.58	91.46	0.040
-62.27	2261.92	93.25	0.041
-61.77	2249.66	95.25	0.042
-61.27	2237.19	97.22	0.043
-60.77	2225.62	99.01	0.044
-60.27	2212.33	101.01	0.046
-59.77	2197.00	103.26	0.047
-59.27	2181.06	105.52	0.048
-58.77	2165.35	107.67	0.050
-58.27	2151.76	109.48	0.051
-57.77	2134.93	111.65	0.052
-57.27	2116.05	113.99	0.054
-56.77	2097.53	116.18	0.055
-56.27	2077.65	118.43	0.057
-55.77	2057.86	120.56	0.059
-55.27	2037.19	122.67	0.060
-54.77	2015.56	124.75	0.062
-54.27	1992.96	126.78	0.064
-53.77	1969.12	128.78	0.065
-53.27	1948.44	130.39	0.067
-52.77	1926.15	131.99	0.069
-52.27	1900.72	133.67	0.070
-51.77	1874.58	135.20	0.072
-51.27	1849.25	136.52	0.074
-50.77	1826.39	137.57	0.075
-50.27	1804.58	138.44	0.077
-49.77	1777.49	139.36	0.078
-49.27	1750.13	140.08	0.080
-48.77	1722.34	140.63	0.082
-48.27	1697.39	140.94	0.083

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-47.77	1675.41	141.09	0.084
-47.27	1650.32	141.11	0.086
-46.77	1623.25	140.96	0.087
-46.27	1599.04	140.67	0.088
-45.77	1573.42	140.22	0.089
-45.27	1552.01	139.72	0.090
-44.77	1529.08	139.07	0.091
-44.27	1506.85	138.32	0.092
-43.77	1484.71	137.46	0.093
-43.27	1461.73	136.46	0.093
-42.77	1440.45	135.43	0.094
-42.27	1421.94	134.45	0.095
-41.77	1398.98	133.14	0.095
-41.27	1378.41	131.87	0.096
-40.77	1355.86	130.40	0.096
-40.27	1335.67	129.00	0.097
-39.77	1317.55	127.69	0.097
-39.27	1296.91	126.13	0.097
-38.77	1276.73	124.54	0.098
-38.27	1259.37	123.13	0.098
-37.77	1240.97	121.58	0.098
-37.27	1224.06	120.12	0.098
-36.77	1206.28	118.53	0.098
-36.27	1187.93	116.85	0.098
-35.77	1171.24	115.28	0.098
-35.27	1156.04	113.81	0.098
-34.77	1142.01	112.42	0.098
-34.27	1126.44	110.84	0.098
-33.77	1111.17	109.25	0.098
-33.27	1096.62	107.69	0.098
-32.77	1082.47	106.14	0.098
-32.27	1069.16	104.65	0.098
-31.77	1056.48	103.19	0.098
-31.27	1041.85	101.47	0.097
-30.77	1029.35	99.97	0.097
-30.27	1017.58	98.52	0.097
-29.77	1005.80	97.04	0.096
-29.27	994.74	95.62	0.096
-28.77	982.51	94.02	0.096
-28.27	971.08	92.49	0.095
-27.77	960.44	91.04	0.095
-27.27	950.23	89.62	0.094

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-26.77	939.87	88.15	0.094
-26.27	929.25	86.61	0.093
-25.77	918.78	85.05	0.093
-25.27	909.28	83.60	0.092
-24.77	899.54	82.07	0.091
-24.27	890.58	80.62	0.091
-23.77	881.88	79.17	0.090
-23.27	873.02	77.66	0.089
-22.77	864.57	76.17	0.088
-22.27	855.89	74.62	0.087
-21.77	848.08	73.19	0.086
-21.27	840.28	71.75	0.085
-20.77	832.61	70.34	0.084
-20.27	824.70	68.88	0.084
-19.77	817.60	67.59	0.083
-19.27	810.12	66.23	0.082
-18.77	802.89	64.93	0.081
-18.27	795.60	63.62	0.080
-17.77	788.89	62.42	0.079
-17.27	782.40	61.27	0.078
-16.77	775.47	60.04	0.077
-16.27	768.53	58.80	0.077
-15.77	762.68	57.75	0.076
-15.27	756.24	56.60	0.075
-14.77	750.24	55.51	0.074
-14.27	744.40	54.45	0.073
-13.77	738.19	53.32	0.072
-13.27	732.82	52.34	0.071
-12.77	727.16	51.31	0.071
-12.27	722.11	50.39	0.070
-11.77	716.59	49.38	0.069
-11.27	711.06	48.37	0.068
-10.77	705.56	47.37	0.067
-10.27	700.48	46.45	0.066
-9.77	695.78	45.60	0.066
-9.27	691.32	44.79	0.065
-8.77	686.40	43.91	0.064
-8.27	681.90	43.11	0.063
-7.77	677.19	42.28	0.062
-7.27	672.50	41.46	0.062
-6.77	667.98	40.68	0.061
-6.27	663.47	39.90	0.060

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-5.77	659.17	39.17	0.059
-5.27	655.08	38.49	0.059
-4.77	650.86	37.79	0.058
-4.27	646.55	37.10	0.057
-3.77	642.48	36.45	0.057
-3.27	638.54	35.84	0.056
-2.77	634.72	35.26	0.056
-2.27	630.73	34.66	0.055
-1.77	626.46	34.04	0.054
-1.27	622.63	33.49	0.054
-0.77	618.86	32.97	0.053
-0.27	615.31	32.48	0.053
0.23	610.71	31.86	0.052
0.73	606.99	31.37	0.052
1.23	603.32	30.88	0.051
1.73	599.66	30.40	0.051
2.23	596.13	29.94	0.050
2.73	592.60	29.49	0.050
3.23	589.02	29.03	0.049
3.73	585.72	28.61	0.049
4.23	582.26	28.18	0.048
4.73	578.96	27.77	0.048
5.23	575.53	27.35	0.048
5.73	572.28	26.97	0.047
6.23	569.00	26.58	0.047
6.73	565.59	26.18	0.046
7.23	562.34	25.80	0.046
7.73	559.08	25.42	0.045
8.23	555.88	25.05	0.045
8.73	553.07	24.74	0.045
9.23	549.62	24.35	0.044
9.73	546.56	24.01	0.044
10.23	543.71	23.69	0.044
10.73	540.73	23.37	0.043
11.23	537.80	23.05	0.043
11.73	534.97	22.76	0.043
12.23	532.08	22.46	0.042
12.73	529.14	22.16	0.042
13.23	526.28	21.88	0.042
13.73	523.46	21.61	0.041
14.23	520.72	21.35	0.041
14.73	517.94	21.10	0.041

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
15.23	515.05	20.84	0.040
15.73	512.50	20.61	0.040
16.23	509.87	20.38	0.040
16.73	507.13	20.14	0.040
17.23	504.34	19.90	0.039
17.73	501.72	19.68	0.039
18.23	499.02	19.46	0.039
18.73	496.45	19.25	0.039
19.23	493.82	19.03	0.039
19.73	491.28	18.83	0.038
20.23	488.57	18.61	0.038
20.73	486.13	18.41	0.038
21.23	483.52	18.20	0.038
21.73	481.09	18.01	0.037
22.23	478.59	17.81	0.037
22.73	476.09	17.60	0.037
23.23	473.66	17.41	0.037
23.73	471.32	17.23	0.037
24.23	468.69	17.02	0.036
24.73	466.35	16.84	0.036
25.23	463.84	16.66	0.036
25.73	461.21	16.46	0.036
26.23	458.85	16.29	0.036
26.73	456.52	16.13	0.035
27.23	454.00	15.95	0.035
27.73	451.50	15.78	0.035
28.23	448.93	15.61	0.035
28.73	446.67	15.47	0.035
29.23	444.10	15.31	0.034
29.73	441.74	15.16	0.034
30.23	439.31	15.02	0.034
30.73	436.82	14.87	0.034
31.23	434.56	14.74	0.034
31.73	432.10	14.60	0.034
32.23	429.81	14.47	0.034
32.73	427.26	14.33	0.034
33.23	425.27	14.21	0.033
33.73	423.07	14.09	0.033
34.23	420.54	13.94	0.033
34.73	418.07	13.80	0.033
35.23	415.75	13.66	0.033
35.73	413.70	13.54	0.033

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
36.23	411.44	13.41	0.033
36.73	409.16	13.27	0.032
37.23	406.82	13.14	0.032
37.73	404.43	13.00	0.032
38.23	402.51	12.90	0.032
38.73	400.24	12.77	0.032
39.23	397.93	12.65	0.032
39.73	395.60	12.53	0.032
40.23	393.63	12.43	0.032
40.73	391.33	12.31	0.031
41.23	389.13	12.20	0.031
41.73	386.94	12.09	0.031
42.23	384.73	11.99	0.031
42.73	382.74	11.90	0.031
43.23	380.62	11.80	0.031
43.73	378.30	11.70	0.031
44.23	375.82	11.60	0.031
44.73	373.61	11.51	0.031
45.23	371.43	11.43	0.031
45.73	369.20	11.35	0.031
46.23	366.48	11.25	0.031
46.73	364.07	11.17	0.031
47.23	361.68	11.10	0.031
47.73	359.28	11.02	0.031
48.23	356.48	10.94	0.031
48.73	353.76	10.86	0.031
49.23	350.67	10.78	0.031
49.73	347.99	10.71	0.031
50.23	345.19	10.64	0.031
50.73	342.12	10.57	0.031
51.23	339.02	10.50	0.031
51.73	336.05	10.43	0.031
52.23	333.12	10.37	0.031
52.73	329.94	10.30	0.031
53.23	326.78	10.24	0.031
53.73	323.46	10.17	0.031
54.23	320.48	10.11	0.032

Table 8 DMA of PCL  $M_w$  43600

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.15	2802.94	62.04	0.022
-118.15	2821.39	57.76	0.020
-117.15	2833.84	54.74	0.019
-116.15	2846.34	51.30	0.018
-115.15	2852.82	49.15	0.017
-114.15	2858.34	46.86	0.016
-113.15	2861.02	45.38	0.016
-112.15	2862.61	43.77	0.015
-111.15	2862.51	42.92	0.015
-110.15	2860.37	41.86	0.015
-109.15	2858.02	41.44	0.015
-108.15	2854.57	41.15	0.014
-107.15	2848.87	40.99	0.014
-106.15	2841.74	40.99	0.014
-105.15	2837.24	41.04	0.014
-104.15	2826.95	41.31	0.015
-103.15	2816.76	41.72	0.015
-102.15	2810.35	42.03	0.015
-101.15	2799.46	42.58	0.015
-100.15	2788.74	43.10	0.015
-99.15	2776.51	43.65	0.016
-98.15	2764.44	44.16	0.016
-97.15	2753.67	44.61	0.016
-96.15	2742.46	45.06	0.016
-95.15	2729.95	45.53	0.017
-94.15	2715.76	45.98	0.017
-93.15	2702.55	46.33	0.017
-92.15	2689.36	46.63	0.017
-91.15	2674.58	46.91	0.018
-90.15	2661.20	47.14	0.018
-89.15	2647.15	47.35	0.018
-88.15	2632.92	47.53	0.018
-87.15	2615.69	47.67	0.018
-86.15	2603.77	47.73	0.018
-85.15	2589.16	47.75	0.018
-84.15	2568.15	47.63	0.019
-83.15	2556.82	47.50	0.019
-82.15	2546.25	47.32	0.019
-81.15	2533.05	47.05	0.019
-80.15	2518.99	46.72	0.019
-79.15	2503.63	46.33	0.019

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-78.15	2490.40	45.99	0.018
-77.15	2477.69	45.68	0.018
-76.15	2462.54	45.35	0.018
-75.15	2450.43	45.11	0.018
-74.15	2439.22	44.90	0.018
-73.15	2424.90	44.66	0.018
-72.15	2412.81	44.49	0.018
-71.15	2401.86	44.37	0.018
-70.15	2389.34	44.29	0.019
-69.15	2379.16	44.31	0.019
-68.15	2365.42	44.48	0.019
-67.15	2351.67	44.84	0.019
-66.15	2341.57	45.24	0.019
-65.15	2325.74	46.13	0.020
-64.15	2313.26	47.09	0.020
-63.15	2299.11	48.47	0.021
-62.15	2282.49	50.45	0.022
-61.15	2265.23	52.88	0.023
-60.15	2245.84	55.91	0.025
-59.15	2222.54	59.82	0.027
-58.15	2197.39	64.16	0.029
-57.15	2168.12	69.20	0.032
-56.15	2132.61	75.13	0.035
-55.15	2096.25	80.87	0.039
-54.15	2054.41	87.03	0.042
-53.15	2010.38	92.97	0.046
-52.15	1958.04	99.30	0.051
-51.15	1905.48	104.89	0.055
-50.15	1852.44	109.78	0.059
-49.15	1797.83	114.02	0.063
-48.15	1741.31	117.57	0.068
-47.15	1688.78	120.10	0.071
-46.15	1632.36	122.00	0.075
-45.15	1577.82	123.07	0.078
-44.15	1527.39	123.39	0.081
-43.15	1474.62	123.07	0.083
-42.15	1428.62	122.26	0.086
-41.15	1381.42	120.93	0.088
-40.15	1338.90	119.31	0.089
-39.15	1298.23	117.41	0.090
-38.15	1254.39	115.01	0.092
-37.15	1218.55	112.78	0.093

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-36.15	1178.97	110.05	0.093
-35.15	1144.77	107.48	0.094
-34.15	1110.83	104.73	0.094
-33.15	1079.50	102.03	0.095
-32.15	1049.76	99.30	0.095
-31.15	1022.63	96.67	0.095
-30.15	996.06	93.95	0.094
-29.15	970.52	91.16	0.094
-28.15	943.05	87.92	0.093
-27.15	921.95	85.23	0.092
-26.15	902.97	82.64	0.092
-25.15	881.39	79.48	0.090
-24.15	860.66	76.25	0.089
-23.15	843.73	73.54	0.087
-22.15	825.68	70.61	0.086
-21.15	808.86	67.87	0.084
-20.15	792.49	65.20	0.082
-19.15	779.39	63.04	0.081
-18.15	763.04	60.32	0.079
-17.15	750.01	58.13	0.078
-16.15	737.67	56.03	0.076
-15.15	726.50	54.10	0.074
-14.15	714.83	52.08	0.073
-13.15	703.94	50.18	0.071
-12.15	694.45	48.54	0.070
-11.15	684.32	46.80	0.068
-10.15	675.30	45.28	0.067
-9.15	666.32	43.81	0.066
-8.15	658.47	42.56	0.065
-7.15	649.71	41.21	0.063
-6.15	642.10	40.09	0.062
-5.15	634.83	39.06	0.062
-4.15	627.23	38.05	0.061
-3.15	619.90	37.13	0.060
-2.15	613.31	36.36	0.059
-1.15	607.28	35.70	0.059
-0.15	600.76	35.04	0.058
0.85	594.68	34.47	0.058
1.85	588.46	33.93	0.058
2.85	583.66	33.54	0.057
3.85	578.17	33.11	0.057
4.85	572.95	32.71	0.057

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
5.85	567.15	32.28	0.057
6.85	561.88	31.89	0.057
7.85	557.19	31.53	0.057
8.85	551.14	31.06	0.056
9.85	546.88	30.72	0.056
10.85	541.88	30.30	0.056
11.85	536.57	29.85	0.056
12.85	531.69	29.44	0.055
13.85	526.92	29.05	0.055
14.85	520.88	28.62	0.055
15.85	517.15	28.40	0.055
16.85	511.53	28.18	0.055
17.85	506.70	28.15	0.056
18.85	501.83	28.06	0.056
19.85	497.71	27.64	0.056
20.85	493.47	27.28	0.055
21.85	489.56	26.91	0.055
22.85	484.31	26.58	0.055
23.85	480.49	26.31	0.055
24.85	475.37	26.02	0.055
25.85	472.01	25.69	0.054
26.85	467.67	25.25	0.054
27.85	463.38	24.99	0.054
28.85	458.85	24.72	0.054
29.85	456.12	24.49	0.054
30.85	451.20	24.23	0.054
31.85	446.61	24.02	0.054
32.85	441.14	23.83	0.054
33.85	437.55	23.43	0.054
34.85	433.97	23.24	0.054
35.85	430.65	23.06	0.054
36.85	427.26	22.93	0.054
37.85	423.98	22.80	0.054
38.85	420.71	22.68	0.054
39.85	417.02	22.56	0.054
40.85	413.74	22.47	0.054
41.85	409.93	22.36	0.055
42.85	406.40	22.20	0.055
43.85	402.60	22.09	0.055
44.85	398.95	21.99	0.055
45.85	395.38	21.90	0.055
46.85	391.81	21.82	0.056

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
47.85	388.47	21.76	0.056
48.85	384.60	21.73	0.057
49.85	380.63	21.72	0.057
50.85	375.84	21.70	0.058
51.85	371.21	21.67	0.058
52.85	366.10	21.62	0.059
53.85	360.84	21.55	0.060
54.85	355.50	21.44	0.062

Table 9 DMA of PCL  $M_w$  32700

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.75	3241.84	64.88	0.020
-118.75	3252.43	61.53	0.019
-117.75	3261.87	58.29	0.018
-116.75	3268.97	55.17	0.017
-115.75	3272.13	53.02	0.016
-114.75	3273.04	51.67	0.016
-113.75	3272.44	49.97	0.015
-112.75	3270.39	48.95	0.015
-111.75	3267.73	48.32	0.015
-110.75	3263.55	47.81	0.015
-109.75	3257.95	47.55	0.015
-108.75	3251.98	47.51	0.015
-107.75	3245.40	47.59	0.015
-106.75	3237.48	47.77	0.015
-105.75	3228.65	48.02	0.015
-104.75	3219.39	48.33	0.015
-103.75	3207.14	48.82	0.015
-102.75	3196.38	49.36	0.015
-101.75	3184.96	50.02	0.016
-100.75	3173.95	50.71	0.016
-99.75	3159.62	51.66	0.016
-98.75	3148.20	52.44	0.017
-97.75	3133.35	53.48	0.017
-96.75	3119.03	54.48	0.017
-95.75	3106.15	55.38	0.018
-94.75	3092.30	56.32	0.018
-93.75	3075.60	57.41	0.019
-92.75	3062.12	58.29	0.019
-91.75	3048.08	59.23	0.019
-90.75	3030.76	60.48	0.020
-89.75	3016.09	61.63	0.020
-88.75	3000.79	62.88	0.021
-87.75	2984.36	64.23	0.022
-86.75	2969.99	65.33	0.022
-85.75	2951.17	66.60	0.023
-84.75	2933.06	67.53	0.023
-83.75	2915.21	68.08	0.023
-82.75	2896.67	68.21	0.024
-81.75	2879.93	67.91	0.024
-80.75	2868.08	67.47	0.024
-79.75	2849.90	66.45	0.023

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-78.75	2833.53	65.21	0.023
-77.75	2818.03	63.84	0.023
-76.75	2800.07	62.14	0.022
-75.75	2786.34	60.87	0.022
-74.75	2774.17	59.81	0.022
-73.75	2760.47	58.74	0.021
-72.75	2743.38	57.64	0.021
-71.75	2731.55	57.07	0.021
-70.75	2720.03	56.67	0.021
-69.75	2708.06	56.43	0.021
-68.75	2695.11	56.33	0.021
-67.75	2680.36	56.41	0.021
-66.75	2669.43	56.60	0.021
-65.75	2659.73	56.88	0.021
-64.75	2640.85	57.73	0.022
-63.75	2630.25	58.39	0.022
-62.75	2613.71	59.68	0.023
-61.75	2595.55	61.50	0.024
-60.75	2577.15	63.75	0.025
-59.75	2556.15	66.78	0.026
-58.75	2537.42	69.80	0.027
-57.75	2511.03	74.40	0.029
-56.75	2482.19	79.60	0.032
-55.75	2445.81	86.09	0.035
-54.75	2420.20	90.50	0.037
-53.75	2372.44	98.21	0.041
-52.75	2336.09	103.60	0.044
-51.75	2288.25	110.08	0.048
-50.75	2224.66	117.66	0.053
-49.75	2182.53	122.04	0.056
-48.75	2120.72	127.58	0.060
-47.75	2064.03	131.77	0.064
-46.75	1996.07	135.72	0.068
-45.75	1939.72	138.14	0.071
-44.75	1863.35	140.26	0.075
-43.75	1818.06	140.89	0.078
-42.75	1741.41	140.95	0.081
-41.75	1697.88	140.45	0.083
-40.75	1636.86	139.13	0.085
-39.75	1603.86	138.12	0.086
-38.75	1551.88	136.12	0.088
-37.75	1505.62	133.94	0.089

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-36.75	1461.73	131.53	0.090
-35.75	1421.26	129.02	0.091
-34.75	1380.60	126.21	0.091
-33.75	1345.29	123.55	0.092
-32.75	1305.59	120.30	0.092
-31.75	1275.18	117.63	0.092
-30.75	1241.15	114.47	0.092
-29.75	1208.45	111.26	0.092
-28.75	1175.99	107.91	0.092
-27.75	1152.08	105.34	0.091
-26.75	1122.79	102.05	0.091
-25.75	1097.14	99.03	0.090
-24.75	1072.16	95.94	0.089
-23.75	1056.91	93.99	0.089
-22.75	1035.70	91.17	0.088
-21.75	1018.32	88.79	0.087
-20.75	994.69	85.41	0.086
-19.75	977.48	82.85	0.085
-18.75	958.35	79.87	0.083
-17.75	942.74	77.30	0.082
-16.75	926.78	74.52	0.080
-15.75	910.93	71.57	0.079
-14.75	895.03	68.43	0.076
-13.75	885.47	66.50	0.075
-12.75	874.81	64.39	0.074
-11.75	861.38	61.83	0.072
-10.75	850.00	59.73	0.070
-9.75	837.44	57.51	0.069
-8.75	828.40	55.97	0.068
-7.75	818.42	54.31	0.066
-6.75	809.41	52.85	0.065
-5.75	800.10	51.38	0.064
-4.75	791.52	50.04	0.063
-3.75	784.32	48.93	0.062
-2.75	776.36	47.73	0.061
-1.75	769.06	46.67	0.061
-0.75	760.26	45.44	0.060
0.25	752.84	44.45	0.059
1.25	746.36	43.61	0.058
2.25	738.71	42.65	0.058
3.25	733.17	41.98	0.057
4.25	725.72	41.10	0.057

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
5.25	720.51	40.51	0.056
6.25	713.12	39.70	0.056
7.25	707.16	39.07	0.055
8.25	701.38	38.48	0.055
9.25	695.63	37.92	0.055
10.25	689.41	37.33	0.054
11.25	683.40	36.78	0.054
12.25	677.25	36.23	0.053
13.25	671.86	35.78	0.053
14.25	665.38	35.26	0.053
15.25	659.66	34.81	0.053
16.25	654.55	34.41	0.053
17.25	648.50	33.91	0.052
18.25	643.00	33.44	0.052
19.25	636.78	32.90	0.052
20.25	630.38	32.36	0.051
21.25	625.21	31.93	0.051
22.25	619.28	31.46	0.051
23.25	613.41	31.01	0.051
24.25	607.43	30.57	0.050
25.25	601.86	30.18	0.050
26.25	595.68	29.75	0.050
27.25	591.92	29.50	0.050
28.25	584.57	29.04	0.050
29.25	576.71	28.57	0.050
30.25	572.14	28.33	0.049
31.25	566.02	28.03	0.049
32.25	558.76	27.71	0.050
33.25	552.48	27.48	0.050
34.25	546.85	27.29	0.050
35.25	540.92	27.12	0.050
36.25	535.23	26.97	0.050
37.25	529.28	26.85	0.051
38.25	523.60	26.74	0.051
39.25	518.55	26.67	0.051
40.25	512.04	26.61	0.052
41.25	504.47	26.58	0.053
42.25	498.40	26.58	0.053
43.25	492.65	26.59	0.054
44.25	486.31	26.62	0.055
45.25	480.75	26.64	0.055
46.25	474.30	26.69	0.056



Temp. (°C)	E' (MPa)	E' (MPa)	tan $\delta$
47.25	467.84	26.75	0.057
48.25	461.32	26.82	0.058
49.25	453.91	26.91	0.059
50.25	447.19	26.98	0.060
51.25	439.50	27.05	0.062
52.25	432.11	27.11	0.063
53.25	423.68	27.18	0.064
54.25	414.72	27.25	0.066
55.25	405.60	27.32	0.067
56.25	396.14	27.39	0.069
57.25	386.25	27.46	0.071
58.25	375.41	27.54	0.074
59.25	364.62	27.63	0.076
60.25	351.81	27.75	0.079
61.25	338.43	27.88	0.083
62.25	322.88	28.03	0.087
63.25	306.50	28.17	0.092
64.25	290.14	28.31	0.096

Table 10 DMA of PCL  $M_w$  24700

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.99	2819.93	88.82	0.032
-118.99	2828.87	86.54	0.031
-117.99	2838.64	84.07	0.030
-116.99	2851.38	80.84	0.028
-115.99	2856.31	79.45	0.028
-114.99	2859.82	78.33	0.027
-113.99	2864.27	76.66	0.027
-112.99	2867.22	75.25	0.026
-111.99	2868.56	74.31	0.026
-110.99	2869.15	73.43	0.026
-109.99	2868.83	72.64	0.025
-108.99	2867.44	72.04	0.025
-107.99	2864.90	71.61	0.025
-106.99	2860.74	71.34	0.025
-105.99	2856.31	71.28	0.025
-104.99	2851.53	71.34	0.025
-103.99	2844.67	71.53	0.025
-102.99	2837.58	71.73	0.025
-101.99	2832.98	71.85	0.025
-100.99	2824.94	72.07	0.026
-99.99	2818.04	72.26	0.026
-98.99	2812.74	72.44	0.026
-97.99	2802.58	72.87	0.026
-96.99	2791.88	73.40	0.026
-95.99	2784.81	73.78	0.027
-94.99	2774.31	74.36	0.027
-93.99	2762.27	74.97	0.027
-92.99	2754.82	75.29	0.027
-91.99	2741.84	75.69	0.028
-90.99	2731.69	75.92	0.028
-89.99	2720.39	76.09	0.028
-88.99	2707.49	76.20	0.028
-87.99	2695.42	76.24	0.028
-86.99	2684.97	76.22	0.028
-85.99	2672.61	76.20	0.029
-84.99	2658.74	76.23	0.029
-83.99	2647.69	76.30	0.029
-82.99	2637.10	76.35	0.029
-81.99	2625.20	76.32	0.029
-80.99	2612.73	76.20	0.029
-79.99	2601.46	76.02	0.029

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-78.99	2589.42	75.77	0.029
-77.99	2580.21	75.51	0.029
-76.99	2568.84	75.09	0.029
-75.99	2556.67	74.52	0.029
-74.99	2547.33	74.03	0.029
-73.99	2534.35	73.35	0.029
-72.99	2523.47	72.82	0.029
-71.99	2512.30	72.37	0.029
-70.99	2503.11	72.12	0.029
-69.99	2491.43	71.96	0.029
-68.99	2481.46	71.96	0.029
-67.99	2471.11	72.05	0.029
-66.99	2461.29	72.22	0.029
-65.99	2450.49	72.52	0.030
-64.99	2438.37	72.98	0.030
-63.99	2428.48	73.51	0.030
-62.99	2416.49	74.33	0.031
-61.99	2405.72	75.24	0.031
-60.99	2393.60	76.47	0.032
-59.99	2379.11	78.22	0.033
-58.99	2362.77	80.57	0.034
-57.99	2348.91	82.83	0.035
-56.99	2327.81	86.53	0.037
-55.99	2305.49	90.59	0.039
-54.99	2278.53	95.48	0.042
-53.99	2245.06	101.31	0.045
-52.99	2215.21	106.19	0.048
-51.99	2175.11	112.24	0.052
-50.99	2132.59	118.01	0.056
-49.99	2095.25	122.52	0.059
-48.99	2042.30	128.08	0.063
-47.99	1982.62	133.22	0.067
-46.99	1931.30	136.75	0.071
-45.99	1880.20	139.45	0.074
-44.99	1830.72	141.32	0.077
-43.99	1777.56	142.57	0.080
-42.99	1731.78	143.04	0.083
-41.99	1687.36	142.98	0.085
-40.99	1637.47	142.38	0.087
-39.99	1589.02	141.31	0.089
-38.99	1547.34	140.02	0.090
-37.99	1502.78	138.31	0.092

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-36.99	1463.08	136.48	0.093
-35.99	1419.75	134.13	0.094
-34.99	1379.22	131.60	0.095
-33.99	1348.83	129.49	0.096
-32.99	1312.01	126.67	0.097
-31.99	1284.22	124.38	0.097
-30.99	1253.51	121.67	0.097
-29.99	1217.76	118.31	0.097
-28.99	1193.81	115.93	0.097
-27.99	1166.34	113.06	0.097
-26.99	1137.55	109.91	0.097
-25.99	1113.38	107.12	0.096
-24.99	1087.51	103.97	0.096
-23.99	1063.48	100.83	0.095
-22.99	1044.59	98.22	0.094
-21.99	1027.23	95.69	0.093
-20.99	1004.46	92.24	0.092
-19.99	989.05	89.82	0.091
-18.99	972.25	87.09	0.090
-17.99	958.76	84.83	0.089
-16.99	945.49	82.53	0.087
-15.99	930.66	79.89	0.086
-14.99	917.86	77.55	0.085
-13.99	906.66	75.46	0.083
-12.99	895.13	73.28	0.082
-11.99	885.43	71.41	0.081
-10.99	876.13	69.62	0.079
-9.99	865.70	67.62	0.078
-8.99	858.05	66.18	0.077
-7.99	849.61	64.61	0.076
-6.99	841.21	63.09	0.075
-5.99	833.48	61.72	0.074
-4.99	825.81	60.39	0.073
-3.99	818.61	59.14	0.072
-2.99	811.38	57.89	0.071
-1.99	804.81	56.73	0.071
-0.99	799.27	55.73	0.070
0.01	792.26	54.38	0.069
1.01	786.76	53.25	0.068
2.01	780.82	51.98	0.067
3.01	776.10	51.02	0.066
4.01	769.43	49.81	0.065

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
5.01	764.59	49.05	0.064
6.01	758.86	48.26	0.064
7.01	753.78	47.63	0.063
8.01	748.38	47.01	0.063
9.01	743.13	46.45	0.063
10.01	738.16	45.95	0.062
11.01	732.03	45.35	0.062
12.01	727.05	44.88	0.062
13.01	720.97	44.33	0.062
14.01	716.25	43.92	0.061
15.01	710.81	43.47	0.061
16.01	705.90	43.08	0.061
17.01	699.61	42.61	0.061
18.01	694.70	42.27	0.061
19.01	688.41	41.84	0.061
20.01	682.92	41.48	0.061
21.01	677.33	41.12	0.061
22.01	671.97	40.78	0.061
23.01	667.66	40.52	0.061
24.01	662.67	40.22	0.061
25.01	656.96	39.89	0.061
26.01	649.08	39.45	0.061
27.01	644.47	39.20	0.061
28.01	639.48	38.93	0.061
29.01	635.05	38.69	0.061
30.01	630.31	38.44	0.061
31.01	626.15	38.23	0.061
32.01	622.07	38.03	0.061
33.01	612.57	37.63	0.061
34.01	607.37	37.45	0.062
35.01	601.37	37.27	0.062
36.01	596.10	37.13	0.062
37.01	590.30	37.01	0.063
38.01	584.83	36.89	0.063
39.01	579.38	36.77	0.064
40.01	574.96	36.67	0.064
41.01	570.16	36.57	0.064
42.01	561.64	36.40	0.065
43.01	555.92	36.30	0.065
44.01	550.04	36.20	0.066
45.01	543.91	36.10	0.066
46.01	536.90	36.02	0.067

<b>Temp. (°C)</b>	<b>E' (MPa)</b>	<b>E'' (MPa)</b>	<b>tan <math>\delta</math></b>
47.01	529.26	35.96	0.068
48.01	521.99	35.94	0.069
49.01	513.59	35.92	0.070
50.01	505.91	35.91	0.071
51.01	497.37	35.88	0.072
52.01	488.61	35.82	0.073
53.01	479.23	35.75	0.075

Table 11 DMA of PCL (CAPA®6500)

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.39	2752.56	45.19	0.016
-118.39	2752.68	44.30	0.016
-117.39	2752.29	43.16	0.015
-116.39	2751.02	42.23	0.015
-115.39	2748.72	41.47	0.015
-114.39	2745.63	40.87	0.015
-113.39	2740.08	40.26	0.015
-112.39	2734.69	39.93	0.015
-111.39	2729.40	39.75	0.015
-110.39	2722.21	39.64	0.015
-109.39	2714.44	39.60	0.015
-108.39	2703.55	39.61	0.015
-107.39	2694.32	39.67	0.015
-106.39	2682.98	39.79	0.015
-105.39	2670.44	39.99	0.015
-104.39	2659.03	40.23	0.015
-103.39	2641.38	40.75	0.016
-102.39	2633.59	41.04	0.016
-101.39	2616.94	41.74	0.016
-100.39	2603.91	42.34	0.017
-99.39	2590.77	43.00	0.017
-98.39	2577.70	43.69	0.017
-97.39	2563.95	44.41	0.017
-96.39	2549.70	45.13	0.018
-95.39	2537.04	45.73	0.018
-94.39	2522.08	46.36	0.018
-93.39	2508.08	46.85	0.019
-92.39	2493.41	47.28	0.019
-91.39	2478.64	47.64	0.019
-90.39	2463.75	47.91	0.019
-89.39	2451.16	48.05	0.019
-88.39	2438.06	48.08	0.019
-87.39	2424.35	48.00	0.019
-86.39	2411.64	47.81	0.019
-85.39	2396.44	47.47	0.019
-84.39	2383.93	47.09	0.019
-83.39	2371.79	46.61	0.019
-82.39	2359.95	46.06	0.019
-81.39	2348.10	45.41	0.019
-80.39	2337.71	44.75	0.018
-79.39	2327.59	44.04	0.018

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-78.39	2315.29	43.11	0.018
-77.39	2306.65	42.43	0.018
-76.39	2295.26	41.54	0.017
-75.39	2286.45	40.86	0.017
-74.39	2276.51	40.11	0.016
-73.39	2267.30	39.44	0.016
-72.39	2258.60	38.82	0.016
-71.39	2248.30	38.12	0.016
-70.39	2238.04	37.47	0.016
-69.39	2229.70	37.01	0.016
-68.39	2219.45	36.57	0.016
-67.39	2209.31	36.29	0.016
-66.39	2198.94	36.21	0.017
-65.39	2187.75	36.42	0.017
-64.39	2179.06	36.82	0.018
-63.39	2168.04	37.63	0.019
-62.39	2154.82	39.07	0.021
-61.39	2141.89	40.98	0.023
-60.39	2125.01	44.05	0.025
-59.39	2105.11	48.21	0.028
-58.39	2083.09	53.12	0.031
-57.39	2056.28	59.14	0.034
-56.39	2020.19	66.96	0.038
-55.39	1985.81	73.92	0.042
-54.39	1936.47	82.97	0.046
-53.39	1892.92	90.08	0.050
-52.39	1834.53	98.44	0.055
-51.39	1779.87	105.14	0.059
-50.39	1730.61	110.28	0.062
-49.39	1662.87	116.01	0.067
-48.39	1598.76	120.01	0.071
-47.39	1550.10	122.14	0.074
-46.39	1484.52	123.78	0.078
-45.39	1430.94	124.10	0.082
-44.39	1361.98	123.21	0.085
-43.39	1308.18	121.55	0.088
-42.39	1267.49	119.77	0.090
-41.39	1217.67	116.99	0.092
-40.39	1176.45	114.23	0.094
-39.39	1131.50	110.76	0.096
-38.39	1095.65	107.66	0.097
-37.39	1059.40	104.27	0.097

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-36.39	1023.27	100.67	0.098
-35.39	989.73	97.14	0.098
-34.39	962.90	94.22	0.098
-33.39	930.37	90.57	0.098
-32.39	908.22	88.01	0.098
-31.39	884.99	85.28	0.097
-30.39	862.82	82.62	0.096
-29.39	840.58	79.87	0.096
-28.39	817.47	76.91	0.095
-27.39	796.49	74.10	0.093
-26.39	779.59	71.72	0.092
-25.39	762.14	69.14	0.091
-24.39	746.58	66.76	0.090
-23.39	728.95	64.04	0.089
-22.39	714.82	61.88	0.087
-21.39	700.90	59.79	0.086
-20.39	684.61	57.37	0.084
-19.39	672.11	55.52	0.083
-18.39	661.03	53.87	0.082
-17.39	646.42	51.70	0.080
-16.39	635.87	50.14	0.079
-15.39	626.21	48.72	0.078
-14.39	613.99	46.93	0.077
-13.39	604.69	45.58	0.075
-12.39	595.30	44.21	0.074
-11.39	585.76	42.83	0.073
-10.39	576.07	41.43	0.072
-9.39	567.56	40.21	0.071
-8.39	559.90	39.13	0.070
-7.39	550.31	37.82	0.069
-6.39	542.80	36.83	0.068
-5.39	534.30	35.76	0.067
-4.39	527.87	34.99	0.067
-3.39	520.31	34.12	0.066
-2.39	513.03	33.32	0.065
-1.39	506.79	32.66	0.065
-0.39	500.74	32.04	0.064
0.61	493.14	31.28	0.064
1.61	486.37	30.64	0.063
2.61	481.80	30.22	0.063
3.61	475.32	29.66	0.063
4.61	469.21	29.17	0.062

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
5.61	462.26	28.65	0.062
6.61	457.50	28.32	0.062
7.61	453.35	28.05	0.062
8.61	447.50	27.69	0.062
9.61	442.78	27.42	0.062
10.61	438.37	27.17	0.062
11.61	433.32	26.90	0.062
12.61	427.95	26.62	0.062
13.61	423.13	26.39	0.062
14.61	418.19	26.16	0.062
15.61	413.32	25.94	0.062
16.61	410.06	25.80	0.063
17.61	404.37	25.54	0.063
18.61	399.70	25.32	0.063
19.61	395.77	25.14	0.063
20.61	391.10	24.92	0.064
21.61	387.54	24.76	0.064
22.61	381.84	24.53	0.064
23.61	378.38	24.41	0.065
24.61	373.81	24.27	0.065
25.61	367.82	24.12	0.066
26.61	362.55	24.01	0.066
27.61	359.45	23.95	0.067
28.61	353.64	23.86	0.068
29.61	348.57	23.78	0.068
30.61	344.09	23.74	0.069
31.61	340.03	23.70	0.070
32.61	335.79	23.68	0.071
33.61	331.54	23.67	0.071
34.61	327.44	23.68	0.072
35.61	323.56	23.70	0.073
36.61	319.64	23.74	0.074
37.61	315.67	23.78	0.075
38.61	311.90	23.84	0.076
39.61	307.97	23.90	0.078
40.61	304.46	23.95	0.079
41.61	300.64	24.02	0.080
42.61	297.04	24.09	0.081
43.61	293.59	24.17	0.083
44.61	289.69	24.28	0.084
45.61	286.47	24.39	0.086
46.61	282.80	24.51	0.087

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
47.61	279.38	24.63	0.088
48.61	275.49	24.75	0.090
49.61	271.55	24.86	0.092
50.61	267.46	24.97	0.093
51.61	263.10	25.07	0.095
52.61	258.96	25.17	0.096
53.61	254.41	25.27	0.098

Table 12 DMA of PCL clay 1%

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-120.60	3192.68	93.75	0.029
-119.60	3175.71	92.65	0.029
-118.60	3165.20	91.97	0.029
-117.60	3148.85	90.93	0.029
-116.60	3134.68	90.04	0.029
-115.60	3122.16	89.26	0.029
-114.60	3106.49	88.28	0.028
-113.60	3089.16	87.19	0.028
-112.60	3074.08	86.24	0.028
-111.60	3063.35	85.57	0.028
-110.60	3045.03	84.47	0.028
-109.60	3031.90	83.73	0.028
-108.60	3016.53	82.93	0.027
-107.60	3001.88	82.26	0.027
-106.60	2987.13	81.70	0.027
-105.60	2972.22	81.28	0.027
-104.60	2957.15	81.08	0.027
-103.60	2940.13	81.15	0.028
-102.60	2926.10	81.42	0.028
-101.60	2913.17	81.84	0.028
-100.60	2898.19	82.49	0.028
-99.60	2881.43	83.34	0.029
-98.60	2869.64	83.96	0.029
-97.60	2854.37	84.74	0.030
-96.60	2836.86	85.55	0.030
-95.60	2824.55	86.06	0.030
-94.60	2806.04	86.73	0.031
-93.60	2788.99	87.30	0.031
-92.60	2774.99	87.77	0.032
-91.60	2757.21	88.38	0.032
-90.60	2743.44	88.81	0.032
-89.60	2728.84	89.17	0.033
-88.60	2712.84	89.36	0.033
-87.60	2694.12	89.31	0.033
-86.60	2680.35	89.12	0.033
-85.60	2666.43	88.81	0.033
-84.60	2652.01	88.39	0.033
-83.60	2640.05	87.98	0.033
-82.60	2625.73	87.40	0.033
-81.60	2610.32	86.64	0.033
-80.60	2600.96	86.10	0.033

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-79.60	2584.31	84.99	0.033
-78.60	2573.16	84.13	0.033
-77.60	2561.22	83.10	0.032
-76.60	2549.79	81.99	0.032
-75.60	2538.78	80.79	0.032
-74.60	2528.21	79.50	0.031
-73.60	2516.09	77.86	0.031
-72.60	2505.34	76.33	0.030
-71.60	2495.89	75.00	0.030
-70.60	2485.51	73.65	0.030
-69.60	2475.86	72.56	0.029
-68.60	2464.18	71.50	0.029
-67.60	2452.14	70.75	0.029
-66.60	2443.68	70.45	0.029
-65.60	2431.30	70.41	0.029
-64.60	2419.98	70.80	0.029
-63.60	2408.37	71.63	0.030
-62.60	2394.89	73.11	0.030
-61.60	2378.37	75.54	0.032
-60.60	2365.29	77.82	0.033
-59.60	2343.03	82.07	0.035
-58.60	2321.58	86.31	0.037
-57.60	2293.92	91.73	0.040
-56.60	2256.46	98.71	0.044
-55.60	2217.34	105.41	0.048
-54.60	2177.74	111.54	0.051
-53.60	2126.21	118.63	0.056
-52.60	2074.59	124.77	0.061
-51.60	2012.51	130.98	0.066
-50.60	1954.67	135.68	0.070
-49.60	1880.39	140.23	0.075
-48.60	1815.78	142.90	0.079
-47.60	1750.08	144.47	0.083
-46.60	1690.26	144.96	0.086
-45.60	1626.94	144.56	0.089
-44.60	1561.38	143.16	0.092
-43.60	1498.98	140.96	0.094
-42.60	1441.90	138.25	0.096
-41.60	1382.73	134.77	0.097
-40.60	1322.95	130.63	0.098
-39.60	1273.67	126.79	0.099
-38.60	1227.30	122.86	0.100



Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-37.60	1185.45	119.11	0.100
-36.60	1147.37	115.55	0.100
-35.60	1108.16	111.79	0.101
-34.60	1074.09	108.47	0.101
-33.60	1035.87	104.71	0.101
-32.60	999.30	101.06	0.101
-31.60	971.46	98.25	0.101
-30.60	942.23	95.25	0.101
-29.60	913.48	92.22	0.101
-28.60	886.78	89.27	0.101
-27.60	860.98	86.25	0.100
-26.60	837.98	83.36	0.099
-25.60	813.43	80.00	0.098
-24.60	792.21	76.84	0.097
-23.60	775.09	74.13	0.096
-22.60	757.88	71.31	0.094
-21.60	741.95	68.65	0.092
-20.60	727.21	66.14	0.091
-19.60	712.95	63.68	0.089
-18.60	697.55	60.96	0.087
-17.60	683.83	58.47	0.086
-16.60	671.92	56.26	0.084
-15.60	660.30	54.07	0.082
-14.60	648.33	51.78	0.080
-13.60	638.50	49.90	0.078
-12.60	628.71	48.03	0.076
-11.60	618.51	46.10	0.075
-10.60	609.35	44.37	0.073
-9.60	600.37	42.70	0.071
-8.60	591.86	41.14	0.070
-7.60	583.57	39.65	0.068
-6.60	575.24	38.18	0.066
-5.60	566.76	36.72	0.065
-4.60	559.76	35.54	0.063
-3.60	552.84	34.41	0.062
-2.60	546.74	33.44	0.061
-1.60	538.71	32.20	0.060
-0.60	533.57	31.44	0.059
0.40	525.17	30.24	0.058
1.40	518.98	29.39	0.057
2.40	513.47	28.65	0.056
3.40	507.57	27.89	0.055

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
4.40	501.87	27.19	0.054
5.40	496.34	26.52	0.053
6.40	490.87	25.88	0.053
7.40	485.30	25.25	0.052
8.40	479.56	24.61	0.051
9.40	474.31	24.04	0.051
10.40	469.99	23.58	0.050
11.40	464.23	22.98	0.049
12.40	459.85	22.53	0.049
13.40	455.03	22.05	0.048
14.40	450.41	21.60	0.048
15.40	444.17	21.00	0.047
16.40	438.16	20.40	0.047
17.40	434.80	20.07	0.046
18.40	430.35	19.63	0.046
19.40	425.03	19.10	0.045
20.40	420.51	18.66	0.044
21.40	415.94	18.23	0.044
22.40	411.10	17.79	0.043
23.40	406.73	17.43	0.043
24.40	403.50	17.17	0.043
25.40	397.99	16.77	0.042
26.40	391.20	16.32	0.042
27.40	387.54	16.10	0.042
28.40	383.14	15.84	0.041
29.40	379.69	15.65	0.041
30.40	374.23	15.36	0.041
31.40	369.78	15.13	0.041
32.40	365.39	14.91	0.041
33.40	361.28	14.71	0.041
34.40	357.15	14.51	0.041
35.40	352.79	14.30	0.041
36.40	348.94	14.12	0.040
37.40	344.82	13.93	0.040
38.40	341.04	13.76	0.040
39.40	337.19	13.60	0.040
40.40	333.67	13.45	0.040
41.40	330.01	13.30	0.040
42.40	326.57	13.18	0.040
43.40	323.19	13.06	0.040
44.40	319.53	12.95	0.041
45.40	316.21	12.86	0.041

<b>Temp. (°C)</b>	<b>E' (MPa)</b>	<b>E'' (MPa)</b>	<b>tan <math>\delta</math></b>
46.40	312.37	12.77	0.041
47.40	308.66	12.69	0.041
48.40	304.59	12.61	0.041
49.40	300.48	12.54	0.042
50.40	296.06	12.47	0.042
51.40	291.44	12.40	0.043
52.40	287.06	12.35	0.043
53.40	282.14	12.28	0.044
54.40	277.52	12.23	0.044

Table 13 DMA of PCL clay 3%

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-120.09	2725.92	68.16	0.025
-119.09	2727.06	66.57	0.024
-118.09	2727.84	65.34	0.024
-117.09	2728.37	64.00	0.023
-116.09	2728.33	63.27	0.023
-115.09	2727.87	62.75	0.023
-114.09	2726.00	62.10	0.023
-113.09	2723.72	61.71	0.023
-112.09	2720.47	61.37	0.023
-111.09	2717.39	61.18	0.023
-110.09	2711.80	61.09	0.023
-109.09	2707.56	61.20	0.023
-108.09	2703.47	61.43	0.023
-107.09	2697.09	61.89	0.023
-106.09	2691.66	62.27	0.023
-105.09	2685.91	62.66	0.023
-104.09	2677.85	63.24	0.024
-103.09	2674.83	63.47	0.024
-102.09	2666.86	64.13	0.024
-101.09	2659.62	64.86	0.024
-100.09	2652.78	65.67	0.025
-99.09	2647.32	66.37	0.025
-98.09	2640.88	67.23	0.025
-97.09	2635.18	68.00	0.026
-96.09	2627.84	68.98	0.026
-95.09	2622.07	69.72	0.027
-94.09	2614.13	70.70	0.027
-93.09	2606.25	71.62	0.027
-92.09	2596.42	72.69	0.028
-91.09	2587.97	73.52	0.028
-90.09	2581.43	74.09	0.029
-89.09	2571.28	74.80	0.029
-88.09	2562.36	75.21	0.029
-87.09	2553.26	75.43	0.030
-86.09	2544.75	75.46	0.030
-85.09	2535.48	75.31	0.030
-84.09	2526.27	75.00	0.030
-83.09	2518.45	74.65	0.030
-82.09	2508.43	74.10	0.030
-81.09	2499.64	73.55	0.029
-80.09	2491.73	73.04	0.029

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-79.09	2480.00	72.25	0.029
-78.09	2473.46	71.81	0.029
-77.09	2463.96	71.19	0.029
-76.09	2437.40	69.60	0.029
-75.09	2432.94	69.35	0.029
-74.09	2424.88	68.90	0.028
-73.09	2417.53	68.48	0.028
-72.09	2412.04	68.18	0.028
-71.09	2401.48	67.68	0.028
-70.09	2395.74	67.50	0.028
-69.09	2386.21	67.33	0.028
-68.09	2376.92	67.36	0.028
-67.09	2364.58	67.70	0.029
-66.09	2355.92	68.17	0.029
-65.09	2347.43	68.85	0.029
-64.09	2339.11	69.77	0.030
-63.09	2327.60	71.49	0.031
-62.09	2314.26	74.09	0.032
-61.09	2301.29	77.01	0.033
-60.09	2282.53	81.52	0.035
-59.09	2254.25	88.36	0.039
-58.09	2225.66	94.98	0.042
-57.09	2199.51	100.66	0.046
-56.09	2155.17	109.45	0.051
-55.09	2118.10	116.06	0.055
-54.09	2062.21	124.85	0.061
-53.09	2009.06	132.04	0.066
-52.09	1942.74	139.56	0.072
-51.09	1891.62	144.34	0.077
-50.09	1812.52	150.09	0.083
-49.09	1742.84	153.60	0.089
-48.09	1702.13	154.90	0.091
-47.09	1633.11	155.99	0.096
-46.09	1563.39	155.70	0.100
-45.09	1518.01	154.69	0.102
-44.09	1456.15	152.38	0.104
-43.09	1403.82	149.56	0.106
-42.09	1357.04	146.40	0.108
-41.09	1320.76	143.52	0.108
-40.09	1266.48	138.51	0.109
-39.09	1231.60	134.85	0.109
-38.09	1196.76	130.83	0.109

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-37.09	1163.88	126.73	0.109
-36.09	1136.27	123.04	0.108
-35.09	1109.90	119.33	0.107
-34.09	1082.30	115.26	0.106
-33.09	1043.58	109.29	0.105
-32.09	1024.82	106.29	0.104
-31.09	998.48	102.03	0.102
-30.09	975.55	98.30	0.101
-29.09	952.82	94.62	0.099
-28.09	933.93	91.59	0.098
-27.09	920.37	89.43	0.097
-26.09	903.55	86.76	0.096
-25.09	883.54	83.59	0.095
-24.09	863.20	80.35	0.093
-23.09	844.94	77.41	0.092
-22.09	832.74	75.42	0.091
-21.09	818.05	72.96	0.089
-20.09	802.34	70.24	0.088
-19.09	787.64	67.57	0.086
-18.09	774.53	65.10	0.084
-17.09	761.72	62.67	0.082
-16.09	747.37	60.03	0.080
-15.09	735.90	58.01	0.079
-14.09	728.18	56.68	0.078
-13.09	714.70	54.44	0.076
-12.09	705.09	52.87	0.075
-11.09	696.18	51.42	0.074
-10.09	684.48	49.52	0.072
-9.09	675.02	47.99	0.071
-8.09	666.53	46.63	0.070
-7.09	658.87	45.40	0.069
-6.09	649.35	43.92	0.068
-5.09	640.78	42.62	0.067
-4.09	631.50	41.26	0.065
-3.09	626.25	40.52	0.065
-2.09	617.04	39.26	0.064
-1.09	610.15	38.34	0.063
-0.09	603.46	37.47	0.062
0.91	596.98	36.65	0.061
1.91	589.91	35.78	0.061
2.91	583.35	34.99	0.060
3.91	575.86	34.13	0.059

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
4.91	569.22	33.39	0.059
5.91	562.42	32.66	0.058
6.91	556.57	32.04	0.058
7.91	549.51	31.31	0.057
8.91	543.60	30.71	0.056
9.91	537.22	30.06	0.056
10.91	531.78	29.52	0.056
11.91	525.84	28.96	0.055
12.91	518.42	28.29	0.055
13.91	512.70	27.81	0.054
14.91	506.84	27.33	0.054
15.91	501.09	26.87	0.054
16.91	495.08	26.41	0.053
17.91	488.98	25.95	0.053
18.91	483.59	25.55	0.053
19.91	478.09	25.16	0.053
20.91	473.05	24.82	0.052
21.91	467.20	24.44	0.052
22.91	461.30	24.10	0.052
23.91	453.36	23.66	0.052
24.91	449.93	23.47	0.052
25.91	442.81	23.09	0.052
26.91	439.36	22.90	0.052
27.91	432.25	22.52	0.052
28.91	428.21	22.31	0.052
29.91	421.54	21.97	0.052
30.91	416.61	21.73	0.052
31.91	411.75	21.49	0.052
32.91	406.74	21.24	0.052
33.91	402.11	21.02	0.052
34.91	397.22	20.80	0.052
35.91	392.71	20.59	0.052
36.91	387.98	20.38	0.053
37.91	383.41	20.19	0.053
38.91	378.90	20.00	0.053
39.91	374.08	19.81	0.053
40.91	370.08	19.67	0.053
41.91	365.45	19.52	0.053
42.91	361.08	19.39	0.054
43.91	356.51	19.28	0.054
44.91	351.88	19.18	0.054
45.91	347.18	19.08	0.055

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
46.91	342.11	18.99	0.056
47.91	337.19	18.91	0.056
48.91	331.60	18.82	0.057
49.91	326.45	18.73	0.057
50.91	320.33	18.63	0.058
51.91	314.32	18.53	0.059
52.91	308.30	18.43	0.060
53.91	301.73	18.31	0.061

Table 14 DMA of PCL clay 5%

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-120.07	3171.49	70.88	0.022
-119.07	3173.03	70.24	0.022
-118.07	3173.16	69.94	0.022
-117.07	3173.07	67.76	0.021
-116.07	3172.17	66.41	0.021
-115.07	3169.18	65.08	0.021
-114.07	3165.86	64.63	0.020
-113.07	3162.25	64.20	0.020
-112.07	3157.64	63.89	0.020
-111.07	3148.51	63.74	0.020
-110.07	3140.23	63.61	0.020
-109.07	3131.04	63.66	0.020
-108.07	3120.63	64.00	0.021
-107.07	3113.42	64.26	0.021
-106.07	3102.62	64.86	0.021
-105.07	3095.10	65.48	0.021
-104.07	3080.86	66.88	0.022
-103.07	3065.96	67.74	0.022
-102.07	3052.79	67.97	0.022
-101.07	3040.16	68.23	0.022
-100.07	3019.47	69.31	0.023
-99.07	3009.36	69.92	0.023
-98.07	2997.41	70.51	0.024
-97.07	2980.30	71.53	0.024
-96.07	2965.51	72.68	0.025
-95.07	2949.44	73.91	0.025
-94.07	2930.58	75.11	0.026
-93.07	2913.31	75.78	0.026
-92.07	2898.75	76.05	0.026
-91.07	2882.41	76.41	0.027
-90.07	2866.97	76.90	0.027
-89.07	2851.35	77.14	0.027
-88.07	2838.92	77.11	0.027
-87.07	2824.08	76.84	0.027
-86.07	2808.86	76.14	0.027
-85.07	2793.49	75.41	0.027
-84.07	2782.95	74.90	0.027
-83.07	2769.43	74.08	0.027
-82.07	2755.10	73.19	0.027
-81.07	2742.06	72.43	0.026
-80.07	2731.48	71.91	0.026

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-79.07	2712.79	70.96	0.026
-78.07	2704.24	70.37	0.026
-77.07	2690.47	69.22	0.026
-76.07	2679.84	68.21	0.025
-75.07	2668.04	67.04	0.025
-74.07	2656.39	65.90	0.025
-73.07	2642.87	64.71	0.025
-72.07	2632.61	63.86	0.024
-71.07	2621.23	63.01	0.024
-70.07	2610.73	62.47	0.024
-69.07	2600.13	62.20	0.024
-68.07	2588.49	62.09	0.024
-67.07	2573.26	62.01	0.024
-66.07	2559.89	62.08	0.024
-65.07	2545.38	62.44	0.024
-64.07	2534.53	63.01	0.025
-63.07	2518.31	64.22	0.025
-62.07	2502.02	65.83	0.026
-61.07	2483.50	67.91	0.027
-60.07	2466.10	70.00	0.029
-59.07	2432.16	75.62	0.032
-58.07	2408.68	80.41	0.034
-57.07	2371.30	88.29	0.038
-56.07	2335.68	95.56	0.041
-55.07	2288.60	104.54	0.046
-54.07	2231.67	114.33	0.051
-53.07	2179.71	122.27	0.056
-52.07	2112.54	131.11	0.062
-51.07	2054.45	137.40	0.067
-50.07	2003.58	141.78	0.070
-49.07	1915.21	147.15	0.076
-48.07	1822.67	149.85	0.082
-47.07	1770.71	150.01	0.084
-46.07	1715.02	149.41	0.087
-45.07	1663.45	148.40	0.089
-44.07	1603.91	146.72	0.092
-43.07	1547.75	144.52	0.093
-42.07	1500.09	142.20	0.095
-41.07	1442.54	138.82	0.096
-40.07	1400.57	135.85	0.097
-39.07	1353.67	132.03	0.098
-38.07	1311.38	128.28	0.098

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-37.07	1274.90	124.88	0.098
-36.07	1236.87	121.25	0.098
-35.07	1201.58	117.65	0.098
-34.07	1161.60	113.24	0.097
-33.07	1136.92	110.35	0.097
-32.07	1108.13	106.92	0.097
-31.07	1077.28	103.25	0.096
-30.07	1053.06	100.35	0.095
-29.07	1023.34	96.71	0.095
-28.07	1002.80	94.15	0.094
-27.07	978.68	91.13	0.093
-26.07	957.01	88.39	0.092
-25.07	932.41	85.17	0.091
-24.07	916.98	83.11	0.091
-23.07	897.91	80.55	0.090
-22.07	878.04	77.89	0.089
-21.07	858.25	75.25	0.088
-20.07	840.61	72.81	0.086
-19.07	827.68	70.93	0.085
-18.07	814.03	68.82	0.084
-17.07	800.00	66.44	0.083
-16.07	785.38	63.62	0.081
-15.07	773.72	61.27	0.079
-14.07	761.41	59.01	0.078
-13.07	748.66	56.94	0.076
-12.07	736.46	55.12	0.075
-11.07	725.90	53.61	0.074
-10.07	715.15	52.11	0.073
-9.07	705.00	50.73	0.072
-8.07	693.54	49.14	0.071
-7.07	683.87	47.74	0.070
-6.07	673.96	46.32	0.069
-5.07	665.21	45.11	0.068
-4.07	656.51	43.93	0.067
-3.07	647.39	42.74	0.066
-2.07	639.38	41.74	0.065
-1.07	630.42	40.67	0.065
-0.07	623.60	39.90	0.064
0.93	614.73	38.90	0.063
1.93	606.77	38.01	0.063
2.93	599.67	37.23	0.062
3.93	591.95	36.44	0.062

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
4.93	584.46	35.67	0.061
5.93	577.70	34.95	0.061
6.93	569.96	34.19	0.060
7.93	563.26	33.61	0.060
8.93	556.48	33.03	0.059
9.93	550.18	32.46	0.059
10.93	543.63	31.89	0.059
11.93	536.93	31.34	0.058
12.93	531.24	30.90	0.058
13.93	523.84	30.29	0.058
14.93	518.23	29.83	0.058
15.93	510.95	29.28	0.057
16.93	505.68	28.90	0.057
17.93	498.09	28.35	0.057
18.93	493.49	28.02	0.057
19.93	488.41	27.65	0.057
20.93	482.74	27.27	0.057
21.93	477.83	26.96	0.056
22.93	473.11	26.67	0.056
23.93	466.61	26.30	0.056
24.93	461.28	26.04	0.056
25.93	455.83	25.78	0.056
26.93	450.96	25.52	0.057
27.93	439.74	24.90	0.057
28.93	436.49	24.73	0.057
29.93	430.65	24.45	0.057
30.93	426.72	24.28	0.057
31.93	421.71	24.06	0.057
32.93	416.04	23.81	0.057
33.93	409.64	23.50	0.057
34.93	404.12	23.19	0.057
35.93	399.28	22.97	0.058
36.93	394.32	22.81	0.058
37.93	389.64	22.70	0.058
38.93	384.88	22.60	0.059
39.93	380.03	22.42	0.059
40.93	375.69	22.22	0.059
41.93	371.05	22.03	0.059
42.93	366.98	21.89	0.060
43.93	362.52	21.76	0.060
44.93	358.15	21.64	0.060
45.93	353.69	21.54	0.061

<b>Temp. (°C)</b>	<b>E' (MPa)</b>	<b>E'' (MPa)</b>	<b>tan <math>\delta</math></b>
46.93	348.68	21.47	0.062
47.93	344.05	21.44	0.062
48.93	338.78	21.37	0.063
49.93	333.76	21.29	0.064
50.93	328.16	21.20	0.065
51.93	322.33	21.12	0.065
52.93	316.50	21.02	0.066
53.93	310.16	20.89	0.067



Table 15 DMA of PCL clay 7%

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.46	3161.12	71.39	0.023
-118.46	3163.10	69.51	0.022
-117.46	3164.70	67.56	0.021
-116.46	3164.92	66.38	0.021
-115.46	3164.01	65.08	0.021
-114.46	3161.74	63.87	0.020
-113.46	3157.82	62.67	0.020
-112.46	3150.75	61.27	0.019
-111.46	3146.36	60.65	0.019
-110.46	3139.03	59.92	0.019
-109.46	3130.71	59.39	0.019
-108.46	3123.89	59.10	0.019
-107.46	3111.51	58.83	0.019
-106.46	3099.18	58.74	0.019
-105.46	3089.82	58.72	0.019
-104.46	3080.63	58.71	0.019
-103.46	3038.10	59.04	0.019
-102.46	3057.69	58.91	0.019
-101.46	3039.31	59.27	0.019
-100.46	3027.65	59.58	0.020
-99.46	3017.28	59.90	0.020
-98.46	3004.99	60.33	0.020
-97.46	2992.94	60.78	0.020
-96.46	2975.56	61.44	0.021
-95.46	2963.87	61.90	0.021
-94.46	2950.45	62.42	0.021
-93.46	2932.31	63.06	0.022
-92.46	2916.41	63.59	0.022
-91.46	2900.55	64.12	0.022
-90.46	2883.64	64.69	0.022
-89.46	2872.95	65.05	0.023
-88.46	2854.62	65.67	0.023
-87.46	2839.62	66.14	0.023
-86.46	2828.36	66.45	0.024
-85.46	2811.09	66.79	0.024
-84.46	2800.56	66.91	0.024
-83.46	2786.93	66.97	0.024
-82.46	2772.55	66.92	0.024
-81.46	2752.40	66.63	0.024
-80.46	2741.56	66.36	0.024
-79.46	2727.53	65.92	0.024

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-78.46	2716.46	65.49	0.024
-77.46	2703.59	64.93	0.024
-76.46	2689.47	64.25	0.024
-75.46	2674.15	63.52	0.024
-74.46	2662.35	62.99	0.024
-73.46	2649.39	62.43	0.024
-72.46	2638.72	62.00	0.024
-71.46	2623.83	61.52	0.023
-70.46	2608.72	61.23	0.023
-69.46	2601.03	61.19	0.024
-68.46	2587.99	61.29	0.024
-67.46	2574.26	61.66	0.024
-66.46	2561.31	62.28	0.024
-65.46	2548.58	63.19	0.025
-64.46	2533.31	64.69	0.025
-63.46	2519.24	66.47	0.026
-62.46	2502.62	69.03	0.027
-61.46	2479.65	73.16	0.029
-60.46	2458.95	77.20	0.031
-59.46	2426.66	83.59	0.034
-58.46	2403.36	88.11	0.036
-57.46	2365.44	95.18	0.040
-56.46	2321.36	102.86	0.044
-55.46	2269.55	111.10	0.049
-54.46	2203.32	120.43	0.055
-53.46	2152.80	126.65	0.059
-52.46	2088.78	133.44	0.064
-51.46	2027.72	138.83	0.069
-50.46	1951.46	144.15	0.074
-49.46	1879.92	147.76	0.079
-48.46	1810.89	150.01	0.083
-47.46	1735.30	151.12	0.087
-46.46	1671.09	150.96	0.090
-45.46	1609.56	149.83	0.093
-44.46	1558.82	148.23	0.095
-43.46	1494.82	145.39	0.097
-42.46	1445.06	142.58	0.098
-41.46	1393.81	139.18	0.100
-40.46	1339.30	135.01	0.101
-39.46	1298.72	131.55	0.101
-38.46	1259.76	127.97	0.101
-37.46	1218.42	123.91	0.102

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-36.46	1179.46	119.88	0.102
-35.46	1147.14	116.41	0.101
-34.46	1112.53	112.56	0.101
-33.46	1087.40	109.69	0.101
-32.46	1057.68	106.21	0.100
-31.46	1031.01	103.00	0.100
-30.46	1006.80	100.02	0.099
-29.46	983.59	97.10	0.099
-28.46	958.39	93.88	0.098
-27.46	935.69	90.92	0.097
-26.46	914.15	88.05	0.096
-25.46	896.65	85.68	0.096
-24.46	879.30	83.28	0.095
-23.46	859.02	80.39	0.094
-22.46	843.50	78.09	0.093
-21.46	826.44	75.44	0.091
-20.46	811.72	73.05	0.090
-19.46	796.98	70.58	0.089
-18.46	781.77	68.04	0.087
-17.46	768.18	65.83	0.086
-16.46	756.47	63.98	0.085
-15.46	743.52	61.98	0.083
-14.46	732.19	60.25	0.082
-13.46	721.54	58.62	0.081
-12.46	710.76	56.97	0.080
-11.46	700.65	55.45	0.079
-10.46	692.19	54.19	0.078
-9.46	682.03	52.71	0.077
-8.46	672.18	51.31	0.076
-7.46	665.04	50.32	0.076
-6.46	655.42	49.00	0.075
-5.46	646.80	47.85	0.074
-4.46	638.49	46.77	0.073
-3.46	630.60	45.77	0.073
-2.46	623.44	44.88	0.072
-1.46	615.83	43.95	0.071
-0.46	608.41	43.05	0.071
0.54	600.77	42.15	0.070
1.54	594.18	41.38	0.070
2.54	586.83	40.54	0.069
3.54	581.07	39.90	0.069
4.54	574.19	39.15	0.068

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
5.54	567.95	38.50	0.068
6.54	561.03	37.79	0.067
7.54	554.46	37.12	0.067
8.54	548.46	36.52	0.067
9.54	542.58	35.94	0.066
10.54	536.68	35.35	0.066
11.54	530.53	34.75	0.066
12.54	524.60	34.18	0.065
13.54	519.32	33.68	0.065
14.54	513.90	33.18	0.065
15.54	507.50	32.61	0.064
16.54	502.10	32.14	0.064
17.54	496.72	31.69	0.064
18.54	491.07	31.24	0.064
19.54	485.10	30.76	0.063
20.54	479.93	30.36	0.063
21.54	474.37	29.94	0.063
22.54	467.95	29.45	0.063
23.54	463.60	29.13	0.063
24.54	458.25	28.74	0.063
25.54	453.13	28.38	0.063
26.54	448.12	28.03	0.063
27.54	442.79	27.67	0.062
28.54	435.68	27.23	0.062
29.54	430.97	26.95	0.063
30.54	425.71	26.65	0.063
31.54	420.53	26.36	0.063
32.54	415.45	26.08	0.063
33.54	412.17	25.90	0.063
34.54	405.55	25.57	0.063
35.54	399.79	25.31	0.063
36.54	392.67	25.01	0.064
37.54	387.96	24.81	0.064
38.54	382.98	24.61	0.064
39.54	377.66	24.39	0.065
40.54	373.95	24.25	0.065
41.54	368.58	24.03	0.065
42.54	363.11	23.83	0.066
43.54	358.36	23.67	0.066
44.54	353.89	23.53	0.066
45.54	349.60	23.41	0.067
46.54	344.58	23.28	0.068

<b>Temp. (°C)</b>	<b>E' (MPa)</b>	<b>E'' (MPa)</b>	<b>tan <math>\delta</math></b>
47.54	340.15	23.16	0.068
48.54	334.98	23.02	0.069
49.54	329.63	22.89	0.069
50.54	323.96	22.76	0.070
51.54	317.32	22.61	0.071
52.54	311.62	22.49	0.072
53.54	304.94	22.34	0.073
54.54	299.30	22.22	0.074

Table 16 DMA of EVA-g-PCL 1:1

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-120.46	3519.50	108.97	0.031
-119.46	3536.14	106.77	0.030
-118.46	3547.97	105.11	0.030
-117.46	3556.51	103.74	0.029
-116.46	3565.51	102.02	0.029
-115.46	3569.10	101.25	0.028
-114.46	3571.24	100.66	0.028
-113.46	3570.98	100.42	0.028
-112.46	3567.84	100.49	0.028
-111.46	3564.84	100.71	0.028
-110.46	3558.52	101.29	0.028
-109.46	3551.97	102.01	0.029
-108.46	3545.21	102.83	0.029
-107.46	3534.60	104.10	0.029
-106.46	3524.49	105.21	0.030
-105.46	3513.38	106.26	0.030
-104.46	3500.92	107.26	0.031
-103.46	3488.90	108.13	0.031
-102.46	3476.74	109.03	0.031
-101.46	3461.40	110.24	0.032
-100.46	3448.60	111.23	0.032
-99.46	3433.55	112.41	0.033
-98.46	3418.51	113.74	0.033
-97.46	3403.89	115.23	0.034
-96.46	3383.83	117.48	0.035
-95.46	3371.00	118.98	0.035
-94.46	3357.64	120.51	0.036
-93.46	3338.23	122.55	0.037
-92.46	3326.30	123.68	0.037
-91.46	3307.34	125.28	0.038
-90.46	3289.33	126.62	0.038
-89.46	3275.19	127.64	0.039
-88.46	3254.86	129.17	0.040
-87.46	3239.88	130.38	0.040
-86.46	3223.08	131.80	0.041
-85.46	3202.94	133.64	0.042
-84.46	3187.57	135.14	0.042
-83.46	3170.03	136.95	0.043
-82.46	3149.89	139.15	0.044
-81.46	3134.01	140.94	0.045
-80.46	3120.98	142.46	0.046

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-79.46	3105.29	144.33	0.046
-78.46	3088.26	146.44	0.047
-77.46	3073.44	148.24	0.048
-76.46	3059.19	149.80	0.049
-75.46	3044.88	151.15	0.050
-74.46	3033.11	152.04	0.050
-73.46	3020.61	152.77	0.051
-72.46	3008.39	153.29	0.051
-71.46	2998.38	153.54	0.051
-70.46	2987.08	153.58	0.051
-69.46	2977.27	153.38	0.052
-68.46	2966.83	152.97	0.052
-67.46	2954.93	152.34	0.052
-66.46	2946.39	151.85	0.052
-65.46	2932.32	151.00	0.051
-64.46	2921.75	150.44	0.051
-63.46	2909.89	150.01	0.052
-62.46	2897.75	149.85	0.052
-61.46	2884.94	149.97	0.052
-60.46	2870.07	150.43	0.052
-59.46	2854.56	151.24	0.053
-58.46	2839.59	152.26	0.054
-57.46	2819.95	153.82	0.055
-56.46	2798.11	155.74	0.056
-55.46	2776.44	157.78	0.057
-54.46	2748.61	160.55	0.058
-53.46	2711.11	164.46	0.061
-52.46	2681.94	167.61	0.062
-51.46	2641.64	172.11	0.065
-50.46	2607.30	176.01	0.067
-49.46	2565.28	180.73	0.070
-48.46	2512.74	186.32	0.074
-47.46	2468.89	190.60	0.077
-46.46	2418.50	195.01	0.081
-45.46	2367.22	198.91	0.084
-44.46	2318.05	202.03	0.087
-43.46	2268.37	204.55	0.090
-42.46	2218.50	206.46	0.093
-41.46	2172.93	207.74	0.096
-40.46	2116.00	208.93	0.099
-39.46	2073.30	209.57	0.101
-38.46	2009.74	210.19	0.105

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-37.46	1950.88	210.41	0.108
-36.46	1904.34	210.31	0.110
-35.46	1854.35	209.90	0.113
-34.46	1797.95	209.00	0.116
-33.46	1748.22	207.79	0.119
-32.46	1699.56	206.22	0.121
-31.46	1645.03	204.03	0.124
-30.46	1609.10	202.32	0.126
-29.46	1559.58	199.62	0.128
-28.46	1510.92	196.58	0.130
-27.46	1469.10	193.65	0.132
-26.46	1419.23	189.72	0.134
-25.46	1378.53	186.13	0.135
-24.46	1335.14	181.88	0.136
-23.46	1299.49	178.00	0.137
-22.46	1256.28	172.84	0.138
-21.46	1225.09	168.83	0.138
-20.46	1184.81	163.37	0.138
-19.46	1152.37	158.87	0.138
-18.46	1120.94	154.48	0.138
-17.46	1083.31	149.26	0.138
-16.46	1047.68	144.34	0.138
-15.46	1020.50	140.62	0.138
-14.46	985.71	135.89	0.138
-13.46	949.39	131.09	0.138
-12.46	920.16	127.41	0.138
-11.46	891.54	123.94	0.139
-10.46	856.82	119.87	0.140
-9.46	828.95	116.65	0.141
-8.46	798.00	113.07	0.142
-7.46	770.24	109.85	0.143
-6.46	743.60	106.75	0.144
-5.46	711.98	103.08	0.145
-4.46	688.87	100.42	0.146
-3.46	658.51	96.97	0.147
-2.46	635.96	94.43	0.149
-1.46	613.00	91.86	0.150
-0.46	592.12	89.51	0.151
0.54	562.24	86.14	0.153
1.54	543.61	84.00	0.155
2.54	522.09	81.47	0.156
3.54	501.26	78.96	0.158

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
4.54	485.12	76.95	0.159
5.54	467.71	74.70	0.160
6.54	451.95	72.60	0.161
7.54	437.29	70.56	0.161
8.54	420.63	68.11	0.162
9.54	410.08	66.47	0.162
10.54	397.10	64.35	0.162
11.54	384.96	62.25	0.162
12.54	373.17	60.09	0.161
13.54	363.85	58.29	0.160
14.54	353.16	56.11	0.159
15.54	345.02	54.35	0.158
16.54	332.32	51.43	0.155
17.54	324.30	49.50	0.153
18.54	315.42	47.32	0.150
19.54	308.07	45.50	0.148
20.54	299.72	43.42	0.145
21.54	292.96	41.74	0.142
22.54	286.42	40.10	0.140
23.54	277.05	37.75	0.136

Table 17 DMA of EVA-g-PCL 1:5

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-119.70	2364.32	61.82	0.025
-118.70	2365.56	60.57	0.025
-117.70	2365.99	59.75	0.025
-116.70	2365.86	58.88	0.025
-115.70	2364.88	58.01	0.025
-114.70	2363.94	57.61	0.025
-113.70	2361.36	57.00	0.024
-112.70	2358.39	56.70	0.024
-111.70	2356.16	56.63	0.024
-110.70	2352.00	56.72	0.024
-109.70	2346.82	57.06	0.025
-108.70	2342.22	57.51	0.025
-107.70	2336.10	58.24	0.025
-106.70	2330.77	58.98	0.025
-105.70	2325.05	59.83	0.026
-104.70	2320.00	60.59	0.026
-103.70	2313.78	61.53	0.027
-102.70	2307.35	62.53	0.027
-101.70	2301.75	63.45	0.028
-100.70	2296.88	64.35	0.028
-99.70	2290.39	65.66	0.029
-98.70	2285.70	66.67	0.030
-97.70	2280.04	67.95	0.030
-96.70	2273.87	69.38	0.031
-95.70	2266.77	71.04	0.032
-94.70	2259.94	72.67	0.033
-93.70	2252.18	74.52	0.033
-92.70	2246.63	75.81	0.034
-91.70	2238.17	77.74	0.035
-90.70	2229.82	79.52	0.035
-89.70	2223.82	80.66	0.036
-88.70	2214.41	82.12	0.036
-87.70	2204.27	83.16	0.037
-86.70	2197.96	83.51	0.037
-85.70	2187.56	83.67	0.037
-84.70	2178.14	83.42	0.038
-83.70	2170.91	83.01	0.038
-82.70	2163.06	82.42	0.038
-81.70	2155.97	81.79	0.038
-80.70	2149.10	81.13	0.038
-79.70	2139.87	80.19	0.037

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-78.70	2132.23	79.38	0.037
-77.70	2127.65	78.89	0.037
-76.70	2121.68	78.26	0.037
-75.70	2116.44	77.69	0.037
-74.70	2110.81	77.06	0.036
-73.70	2104.95	76.39	0.036
-72.70	2099.98	75.83	0.036
-71.70	2095.43	75.34	0.036
-70.70	2089.43	74.75	0.036
-69.70	2083.29	74.21	0.036
-68.70	2077.67	73.80	0.035
-67.70	2070.75	73.41	0.035
-66.70	2065.65	73.22	0.035
-65.70	2057.69	73.08	0.035
-64.70	2052.38	73.10	0.036
-63.70	2044.52	73.29	0.036
-62.70	2036.70	73.67	0.036
-61.70	2029.39	74.19	0.037
-60.70	2021.16	74.96	0.037
-59.70	2012.33	75.97	0.038
-58.70	2003.90	77.08	0.039
-57.70	1993.77	78.56	0.040
-56.70	1981.40	80.52	0.041
-55.70	1967.25	82.89	0.043
-54.70	1956.01	84.84	0.044
-53.70	1940.13	87.57	0.046
-52.70	1926.87	89.81	0.047
-51.70	1907.70	92.94	0.049
-50.70	1886.01	96.33	0.052
-49.70	1865.79	99.34	0.054
-48.70	1837.10	103.39	0.057
-47.70	1816.36	106.14	0.059
-46.70	1789.40	109.50	0.061
-45.70	1766.76	112.10	0.063
-44.70	1736.42	115.24	0.066
-43.70	1705.93	118.02	0.069
-42.70	1672.63	120.67	0.072
-41.70	1644.56	122.61	0.074
-40.70	1612.04	124.56	0.077
-39.70	1578.49	126.23	0.080
-38.70	1548.66	127.44	0.082
-37.70	1516.80	128.41	0.084

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-36.70	1482.77	129.08	0.087
-35.70	1450.39	129.40	0.089
-34.70	1416.52	129.42	0.091
-33.70	1385.88	129.16	0.093
-32.70	1350.77	128.56	0.095
-31.70	1320.82	127.82	0.097
-30.70	1293.98	127.00	0.098
-29.70	1251.53	125.38	0.100
-28.70	1223.49	124.12	0.101
-27.70	1191.82	122.49	0.103
-26.70	1164.78	120.93	0.104
-25.70	1132.14	118.83	0.105
-24.70	1102.78	116.71	0.106
-23.70	1070.77	114.16	0.106
-22.70	1044.35	111.89	0.107
-21.70	1016.50	109.32	0.107
-20.70	994.72	107.18	0.107
-19.70	970.40	104.65	0.107
-18.70	940.24	101.28	0.107
-17.70	915.73	98.33	0.107
-16.70	894.46	95.59	0.106
-15.70	873.65	92.75	0.106
-14.70	851.61	89.56	0.105
-13.70	829.10	86.16	0.104
-12.70	810.76	83.36	0.103
-11.70	790.97	80.37	0.102
-10.70	771.27	77.41	0.101
-9.70	752.81	74.61	0.100
-8.70	735.09	71.89	0.098
-7.70	721.03	69.72	0.097
-6.70	700.64	66.57	0.095
-5.70	686.80	64.42	0.094
-4.70	674.73	62.54	0.093
-3.70	658.55	60.01	0.091
-2.70	643.22	57.61	0.090
-1.70	631.81	55.82	0.088
-0.70	619.26	53.84	0.087
0.30	605.27	51.61	0.085
1.30	593.55	49.70	0.084
2.30	581.66	47.75	0.082
3.30	570.98	45.99	0.080
4.30	561.97	44.51	0.079

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
5.30	551.40	42.77	0.077
6.30	539.41	40.79	0.075
7.30	531.00	39.40	0.074
8.30	521.39	37.78	0.072
9.30	512.90	36.34	0.071
10.30	504.57	34.92	0.069
11.30	496.21	33.49	0.067
12.30	487.14	31.95	0.066
13.30	480.34	30.80	0.064
14.30	472.82	29.54	0.063
15.30	465.34	28.30	0.061
16.30	458.34	27.15	0.060
17.30	452.63	26.24	0.058
18.30	446.25	25.25	0.057
19.30	440.23	24.35	0.056
20.30	433.55	23.39	0.054
21.30	426.54	22.42	0.053
22.30	421.70	21.78	0.052
23.30	414.42	20.86	0.050
24.30	409.61	20.27	0.049
25.30	403.82	19.59	0.048
26.30	397.96	18.89	0.047
27.30	391.79	18.15	0.046
28.30	386.61	17.52	0.045

Table 17 DMA of EVA-g-PCL 1:10

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-120.03	1525.07	64.38	0.042
-119.03	1526.18	63.91	0.042
-118.03	1527.06	63.64	0.042
-117.03	1528.09	63.46	0.042
-116.03	1528.68	63.38	0.042
-115.03	1529.10	63.39	0.042
-114.03	1529.59	63.65	0.042
-113.03	1529.86	63.94	0.042
-112.03	1529.96	64.17	0.042
-111.03	1529.81	64.27	0.042
-110.03	1529.39	64.25	0.042
-109.03	1528.65	64.22	0.042
-108.03	1527.67	64.26	0.042
-107.03	1526.36	64.27	0.042
-106.03	1524.79	64.14	0.042
-105.03	1523.07	63.97	0.042
-104.03	1520.45	63.74	0.042
-103.03	1517.44	63.45	0.042
-102.03	1515.18	63.22	0.042
-101.03	1511.20	62.80	0.042
-100.03	1507.38	62.38	0.041
-99.03	1504.00	62.02	0.041
-98.03	1499.47	61.65	0.041
-97.03	1495.15	61.36	0.041
-96.03	1491.26	61.10	0.041
-95.03	1486.43	60.69	0.041
-94.03	1481.55	60.19	0.041
-93.03	1477.38	59.75	0.041
-92.03	1471.66	59.21	0.041
-91.03	1466.09	58.81	0.040
-90.03	1461.34	58.56	0.040
-89.03	1456.14	58.32	0.040
-88.03	1450.11	58.17	0.040
-87.03	1444.52	58.07	0.040
-86.03	1439.45	57.82	0.040
-85.03	1433.51	57.34	0.040
-84.03	1429.27	56.99	0.040
-83.03	1423.94	56.60	0.040
-82.03	1418.25	56.20	0.039
-81.03	1413.60	55.88	0.039
-80.03	1409.18	55.57	0.039

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-79.03	1404.48	55.21	0.039
-78.03	1400.68	54.85	0.039
-77.03	1396.03	54.42	0.039
-76.03	1392.01	54.05	0.039
-75.03	1388.52	53.67	0.038
-74.03	1384.62	53.19	0.038
-73.03	1381.23	52.76	0.038
-72.03	1378.44	52.52	0.038
-71.03	1375.14	52.33	0.038
-70.03	1372.09	52.15	0.038
-69.03	1370.18	51.98	0.038
-68.03	1367.89	51.74	0.038
-67.03	1366.21	51.55	0.038
-66.03	1364.24	51.35	0.038
-65.03	1361.96	51.23	0.038
-64.03	1359.92	51.32	0.038
-63.03	1357.66	51.59	0.038
-62.03	1354.65	52.13	0.039
-61.03	1352.11	52.64	0.039
-60.03	1348.75	53.31	0.040
-59.03	1344.13	54.34	0.041
-58.03	1340.62	55.17	0.041
-57.03	1335.49	56.32	0.042
-56.03	1329.67	57.48	0.044
-55.03	1323.27	58.74	0.045
-54.03	1316.07	60.23	0.046
-53.03	1307.08	62.10	0.048
-52.03	1299.17	63.74	0.050
-51.03	1289.05	65.75	0.052
-50.03	1278.64	67.74	0.054
-49.03	1266.13	69.95	0.056
-48.03	1250.93	72.33	0.058
-47.03	1240.86	73.76	0.060
-46.03	1221.85	76.22	0.063
-45.03	1204.26	78.38	0.066
-44.03	1184.87	80.71	0.069
-43.03	1165.44	82.88	0.072
-42.03	1145.98	84.82	0.075
-41.03	1123.15	86.84	0.078
-40.03	1105.83	88.31	0.081
-39.03	1085.66	90.01	0.084
-38.03	1065.57	91.60	0.087



Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
-37.03	1037.76	93.53	0.090
-36.03	1017.14	94.70	0.093
-35.03	996.99	95.63	0.096
-34.03	971.86	96.46	0.099
-33.03	946.22	96.93	0.102
-32.03	927.47	97.04	0.104
-31.03	909.18	96.98	0.105
-30.03	883.31	96.57	0.108
-29.03	865.74	96.01	0.109
-28.03	842.61	94.77	0.111
-27.03	825.37	93.42	0.112
-26.03	805.85	91.59	0.112
-25.03	788.33	89.90	0.113
-24.03	770.82	88.14	0.113
-23.03	753.96	86.26	0.113
-22.03	739.24	84.40	0.113
-21.03	723.09	82.10	0.113
-20.03	707.49	79.64	0.112
-19.03	692.82	77.20	0.111
-18.03	678.21	74.68	0.110
-17.03	661.40	71.70	0.108
-16.03	649.73	69.61	0.107
-15.03	635.12	67.01	0.105
-14.03	622.52	64.69	0.104
-13.03	610.29	62.35	0.102
-12.03	596.67	59.68	0.100
-11.03	585.14	57.42	0.099
-10.03	574.51	55.29	0.097
-9.03	566.40	53.67	0.096
-8.03	553.68	51.19	0.094
-7.03	543.06	49.21	0.093
-6.03	535.05	47.81	0.091
-5.03	525.50	46.32	0.090
-4.03	517.81	45.28	0.089
-3.03	510.99	44.44	0.088
-2.03	504.95	43.75	0.087
-1.03	498.41	43.06	0.086
-0.03	492.74	42.41	0.085
0.97	488.07	41.78	0.084
1.97	484.16	41.15	0.084
2.97	480.15	40.39	0.083
3.97	476.36	39.52	0.082

Temp. (°C)	E' (MPa)	E'' (MPa)	tan $\delta$
4.97	472.86	38.56	0.081
5.97	470.28	37.68	0.081
6.97	467.67	36.53	0.080
7.97	466.57	35.83	0.079
8.97	466.73	35.50	0.079
9.97	468.25	35.65	0.078
10.97	470.95	36.16	0.077
11.97	473.30	36.68	0.077
12.97	476.52	37.33	0.076
13.97	478.86	37.42	0.074
14.97	479.62	36.82	0.073
15.97	479.33	35.94	0.072
16.97	478.06	34.66	0.070
17.97	476.24	33.41	0.069
18.97	473.24	31.79	0.067
19.97	470.25	30.43	0.065
20.97	466.44	28.89	0.063
21.97	463.83	27.95	0.062
22.97	458.80	26.43	0.059
23.97	456.33	25.82	0.058
24.97	452.27	24.96	0.057
25.97	460.45	26.19	0.059
26.97	441.08	23.11	0.053
27.97	436.91	22.57	0.052
28.97	433.00	22.11	0.051
29.97	427.41	21.57	0.049
30.97	424.47	21.31	0.048
31.97	420.56	20.95	0.048
32.97	417.92	20.67	0.047
33.97	412.05	19.93	0.046
34.97	407.36	19.31	0.046
35.97	403.27	18.86	0.045
36.97	398.62	18.48	0.045
37.97	393.82	18.19	0.045
38.97	388.71	17.96	0.045
39.97	382.95	17.81	0.046
40.97	377.03	17.68	0.047
41.97	370.33	17.47	0.048
42.97	363.75	17.22	0.050
43.97	357.07	17.14	0.052
44.97	349.49	17.52	0.055
45.97	341.11	18.66	0.059

<b>Temp. (°C)</b>	<b>E' (MPa)</b>	<b>E'' (MPa)</b>	<b>tan <math>\delta</math></b>
46.97	331.23	20.88	0.063
47.97	321.08	23.14	0.068
48.97	310.43	24.19	0.073
49.97	301.07	24.01	0.079
50.97	291.74	23.26	0.085
51.97	281.60	22.64	0.093
52.97	270.71	22.66	0.100
53.97	257.79	23.69	0.109
54.97	242.14	25.77	0.117
55.97	221.75	28.40	0.127
56.97	198.06	29.80	0.137
57.97	173.57	29.77	0.146
58.97	148.87	28.19	0.156
59.97	124.10	26.08	0.166



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**Proceeding:**

1. Ngamnawakul, B.; and Magaraphan, R. (2008, August 19 -20) Synthesis and Thermal Properties of a New Biodegradable Polymer EVA-g-PCL. Proceedings of the Thai-Japan Joint Symposium on Advances in Materials Science and Environmental Technology 2008, Bangkok, Thailand.
2. Ngamnawakul, B.; Nooeiad, P.; and Magaraphan, R. (2008, November 6-8) Dynamic Mechanical and Thermal Properties of EVOH-g-PLA Nanocomposites. Proceedings of the NanoThailand Symposium 2008, Bangkok, Thailand.
3. Ngamnawakul, B.; and Magaraphan, R. (2009, February 25-27) Synthesis and Thermal Properties of New Biodegradable Polymer EVA-g-PCL and EVA-g-PLA. Proceedings of the GPEC Conference 2009, Orlando, Florida, USA.
4. Ngamnawakul, B.; and Magaraphan, R. (2009, April 22) Structure and Mechanical Property Relationship of PCL, its Nanocomposites, and its Graft Copolymer. Proceedings of the 15<sup>th</sup> PPC Symposium on Petroleum, Petrochems, and Polymers, Bangkok, Thailand.

**Presentations:**

1. Ngamnawakul, B.; and Magaraphan, R. (2008, August 19-20) Synthesis and Thermal Properties of a New Biodegradable Polymer EVA-g-PCL. Poster presented at Thai-Japan Joint Symposium on Advances in Materials Science and Environmental Technology 2008, Bangkok, Thailand.
2. Ngamnawakul, B.; Nooeiad, P.; and Magaraphan, R. (2008, November 6-8) Dynamic Mechanical and Thermal Properties of EVOH-g-PLA Nanocomposites. Poster presented at NanoThailand Symposium 2008, Bangkok, Thailand.

3. Ngamnawakul, B.; and Magaraphan, R. (2009, February 25-27) Synthesis and Thermal Properties of New Biodegradable Polymer EVA-g-PCL and EVA-g-PLA. Poster presented at GPEC Conference 2009, Orlando, Florida, USA.
4. Ngamnawakul, B.; and Magaraphan, R. (2009, April 22) Structure and Mechanical Property Relationship of PCL, its Nanocomposites, and its Graft Copolymer. Poster presented at 15<sup>th</sup> PPC Symposium on Petroleum, Petrochems, and Polymers, Bangkok, Thailand.