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APPENDICES

Rheological Data

The measurements were performed by a Fluid Rheometer (Rheometric, ARES) using the cone-and-plate geometry with a cone angle of 0.04 rad and a diameter of 50 mm. The gap range was 0.051±1mm and the temperature was set at 26±1 °C. In the dynamic strain sweep default test, the experiments were carried out at the frequency of 1.0 rad/sec. Initial strain and final strain were equal to 0.1 and 100%, respectively. In these experiments, levels of strain were chosen in order to ensure that all subsequent measurements were made within the linear viscoelastic regime.

In the dynamic frequency sweep default test, initial and final frequency were equal to 100 and 0.1 rad/sec, respectively. In the steady rate sweep default test, initial and final rates were equal to 0.01 to 100 s^{-1}. The data mode was time based. Time delay and measurement times were 0.1 and 1 sec, respectively. The direction was clockwise, only one direction per measurement.

I1. Data for η_o vs. aging time of various systems with low FA concentration. (Figure 3.1)

Time (day)	η_o (P)					
	CTAC/FA 1.0/2.0 (%wt)	**BTAC/FA 1.0/2.0 (%wt)**	**CTAC/FA/HEC 1.0/2.0/0.5 (%wt)**			
	Set 1	Set 1	Set 1	Set 2	Mean	Std.
1	989.0	1960.0	179.0	-	-	-
4	1080.0	1970.0	154.0	-	-	-
7	1080.0	2260.0	211.0	-	-	-
14	1200.0	3660.0	4020.0	2378.0	3199.0	1161.1
21	1460.0	3850.0	4880.0	-	-	-
28	1500.0	3560.0	4730.0	-	-	-

I2 Data for η_o vs. aging time of various systems with high FA concentration. (Figure 3.2)

Time (day)	η_o (P)					
	CTAC/FA 1.0/2.0 (%wt)	**BTAC/FA 1.0/2.0 (%wt)**	**CTAC/FA/HEC 1.0/2.0/0.5 (%wt)**			
	Set 1	Set 1	Set 1	Set 2	Mean	Std.
1	11000.0	17700.0	10700.0	-	-	-
4	12000.0	17800.0	10800.0	-	-	-
7	13200.0	19500.0	11500.0	-	-	-
14	13500.0	25900.0	18000.0	19000.0	18500.0	707.1
21	13210.0	26100.0	20100.0	-	-	-

I3 Data for tanδ vs. FA concentration of CTAC/FA and BTAC/FA systems at equilibrium. (Figure 3.27)

FA (%wt/wt)	tanδ				
	CTAC/FA (CTAC = 1.0%)				BTAC/FA (BTAC = 1.0%)
	Set 1	Set 2	Mean	Std.	Set 1
2.0	0.463	0.440	0.452	0.016	0.400
3.0	0.355	0.335	0.345	0.014	0.329
4.0	0.316	0.356	0.336	0.028	0.304
5.0	0.202	0.294	0.248	0.065	0.287
6.0	0.227	-	-	-	0.257
7.0	0.209	0.262	0.235	0.037	0.255
8.0	0.206	0.219	0.212	0.009	0.227

I4 Data for G_N^0 vs. FA concentration of CTAC/FA and BTAC/FA systems at equilibrium. (Figure 3.28)

FA (%wt/wt)	G_N^0 (dyn/cm^2)					
	CTAC/FA (CTAC = 1.0%wt)					BTAC/FA (BTAC = 1.0%wt)
	Set 1	Set 2	Set 3	Mean	Std.	Set 1
2.0	2160.0	1730.0	1510.9	1800.0	303.2	2800.0
3.0	6840.0	7010.0	6504.3	6784.8	257.3	9890.0
4.0	35000.0	12100.0	12049.0	19816.3	13236.1	13100.0
5.0	65000.0	23800.0	26340.0	38380.0	23088.5	25300.0
6.0	113000.0	79775.0	-	96382.5	23493.6	25700.0
7.0	125000.0	242000.0	-	183500.0	82731.5	43000.0
8.0	150000.0	266000.0	-	208000.0	82024.4	49000.0

I5 Data for τ_B vs. FA concentration of CTAC/FA and BTAC/FA systems at equilibrium. (Figure 3.29)

FA (%wt/wt)	τ_B (dyn/cm^2)				
	CTAC/FA (CTAC = 1.0%wt)				BTAC/FA (BTAC = 1.0%wt)
	Set 1	Set 2	Mean	Std.	Set 1
2.0	137.0	158.0	147.5	14.8	162.0
3.0	380.0	-	-	-	398.0
4.0	560.0	625.0	592.5	45.9	548.0
5.0	889.0	-	-	-	720.0
6.0	1440.0	1485.0	1462.5	31.8	860.0
7.0	2580.0	-	-	-	880.0
8.0	2700.0	2650.0	2675.0	35.4	1040.0

I6 Data for η_o vs. FA concentration of CTAC/FA and BTAC/FA systems at equilibrium. (Figure 3.30)

FA (%wt/wt)	η_o (P)				
	CTAC/FA (CTAC = 1.0%wt)				BTAC/FA (BTAC = 1.0%wt)
	Set 1	Set 2	Mean	Std.	Set 1
2.0	1576.7	1387.4	1482.0	133.8	3660.0
3.0	2700.8	3725.2	3213.0	724.4	5566.1
4.0	4646.6	4491.6	4569.1	109.6	14690.0
5.0	6991.3	8463.9	7727.6	1041.2	29978.0
6.0	10027.0	15757.0	12892.0	4051.7	30416.0
7.0	11775.0	16967.0	14371.0	3671.3	40880.0
8.0	33014.0	21645.0	27329.5	8039.1	45198.0

I7 Data for tanδ vs. FA concentration of CTAC/FA and CTAC/FA/HEC systems at equilibrium. (Figure 3.41)

FA (%wt/wt)	tanδ			
	CTAC/FA (CTAC = 1.0%wt)			
	Set 1	Set 2	Mean	Std.
2.0	0.463	0.440	0.451	0.016
3.0	0.355	0.335	0.345	0.014
4.0	0.316	0.350	0.330	0.024
5.0	0.202	0.294	0.248	0.065
6.0	0.227	0.297	0.262	0.019
7.0	0.209	0.260	0.234	0.036
8.0	0.206	0.219	0.212	0.009

FA (%wt/wt)	tanδ			
	CTAC/FA/HEC (CTAC = 1.0%wt, HEC = 0.5%wt)			
	Set 1	Set 2	Mean	Std.
2.0	1.220	1.025	1.122	0.138
3.0	0.469	0.456	0.462	0.009
4.0	0.414	0.409	0.411	0.003
5.0	0.498	0.392	0.445	0.075
6.0	0.341	0.377	0.359	0.025
7.0	0.340	-	-	-
8.0	0.402	-	-	-

I8 Data for G_N^o vs. FA concentration of CTAC/FA and CTAC/FA/HEC systems at equilibrium. (Figure 3.42)

FA (%wt/wt)	G_N^o (dyn/cm^2) CTAC/FA (CTAC = 1.0%wt)				
	Set 1	Set 2	Set 3	Mean	Std.
2.0	2160.0	1730.0	1510.9	1800.3	330.2
3.0	6840.0	7010.0	6504.3	6784.8	257.3
4.0	35000.0	12100.0	12049.0	19816.3	13236.1
5.0	65000.0	23800.0	26340.0	38380.0	23088.5
6.0	113000.0	79775.0	-	96382.5	23493.6
7.0	125000.0	242000.0	-	183500.0	82731.5
8.0	150000.0	266000.0	-	208000.0	82024.4

FA (%wt/wt)	G_N^o (dyn/cm^2) CTAC/FA /HEC (CTAC = 1.0%wt, HEC = 0.5%wt)				
	Set 1	Set 2	Set 3	Mean	Std.
2.0	471.0	317.7	272.6	353.8	104.0
3.0	4470.0	-	4380.4	4425.2	63.4
4.0	5910.0	6444.8	8044.8	6799.9	1110.8
5.0	15900.0	-	-	-	-
6.0	19600.0	19012.0	19300.0	19304.0	294.0
7.0	26700.0	24500.0	-	25600.0	1555.6
8.0	32555.0	32267.0	-	32411.0	203.6

I9 Data for τ_B vs. FA concentration of CTAC/FA and CTAC/FA/HEC systems at equilibrium. (Figure 3.43)

FA (%wt/wt)	τ_B (dyn/cm^2) CTAC/FA (CTAC = 1.0%wt)			
	Set 1	Set 2	Mean	Std.
2.0	137.0	158.0	147.5	14.8
3.0	380.0	-	-	-
4.0	560.0	625.0	592.5	42.9
5.0	889.0	-	-	-
6.0	1440.0	1485.0	1462.5	31.8
7.0	2580.0	-	-	-
8.0	2700.0	2650.0	2675	35.3

FA (%wt/wt)	τ_B (dyn/cm^2) CTAC/FA /HEC (CTAC = 1.0%wt, HEC = 0.5%wt)				
	Set 1	Set 2	Set 3	Mean	Std.
2.0	123.0	90.0	83.0	98.6	21.4
3.0	320.0	300.0	-	310.0	14.1
4.0	442.0	500.0	480.0	474.0	29.5
5.0	800.0	-	-	-	-
6.0	920.0	860.0	-	890.0	42.4
7.0	1360.0	1100.0	-	1230.0	183.8
8.0	1540.0	1400.0	-	1470.0	99.0

I10 Data for η_o vs. FA concentration of CTAC/FA and CTAC/FA/HEC systems at equilibrium. (Figure 3.45)

FA (%wt/wt)	η_o (P) CTAC/FA (CTAC = 1.0%wt)			
	Set 1	Set 2	Mean	Std.
2.0	1576.7	1387.4	1482.0	133.9
3.0	2700.8	3725.2	3213.0	724.4
4.0	4646.6	4491.6	4569.1	109.6
5.0	6991.3	8463.9	7727.6	1041.3
6.0	10027.0	15757.0	12892.0	4051.7
7.0	11775.0	16967.0	14371.0	3671.3
8.0	33014.0	21645.0	27329.5	8039.1

FA (%wt/wt)	η_o (P) CTAC/FA/HEC (CTAC = 1.0%wt, HEC = 0.5%wt)			
	Set 1	Set 2	Mean	Std.
2.0	2378.0	4130.0	3254.0	1238.8
3.0	4630.0	3974.9	4302.4	463.2
4.0	5060.0	5677.2	5368.6	436.4
5.0	10400.0	-	-	-
6.0	15023.0	18510.0	16766.5	2465.7
7.0	28000.0	-	-	-
8.0	35746.0	35900.0	35823.0	108.9

Effect of Annealing

I11 Data for η_o vs. aging time of the CTAC/FA = 1.0/2.0. (Figure 3.46)

Time (day)	η_o (P)												
	26 °C	40 °C				53 °C				80 °C			
	Set 1	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.
1	5320.0	3120.0	2865.0	2992.5	180.3	355.0	498.0	426.5	101.1	52.0	95.0	73.5	30.4
2	4990.0	3270.0	-	-	-	529.0	-	-	-	81.8	-	-	-
3	4690.0	3690.0	-	-	-	622.0	-	-	-	194.0	-	-	-
4	5600.0	3690.0	-	-	-	1370.0	-	-	-	610.0	-	-	-
5	5410.0	4090.0	-	-	-	1860.0	-	-	-	1280.0	-	-	-
7	5080.0	2980.0	2963.0	2971.5	12.0	3230.0	4320.0	3775.0	770.7	3960.0	2847.0	3403.5	787.0
14	7330.0	3750.0	-	-	-	4930.0	-			2580.0			-
21	8730.0	3670.0	-	-	-	6490.0	-			7760.0			-

Effect of Annealing

I12 Data for η_o vs. aging time of the CTAC/FA = 1.0/4.0. (Figure 3.47)

Time (day)	η_o (P)												
	26 °C	**40 °C**				**53 °C**				**80 °C**			
	Set 1	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.
1	16300.0	21000.0	28000.0	24500.0	2474.8	28500.0	24000.0	26250.0	3181.9	10900.0	12000.0	11450.0	777.8
2	16700.0	-	-	-	-	26700.0	-	-	-	12900.0	-	-	-
3	15300.0	20300.0	-	-	-	25300.0	-	-	--	14000.0	-	-	-
4	16000.0	28000.0	-	-	-	29000.0	-	-	-	13800.0	-	-	-
5	18000.0	29700.0	-	-	-	47300.0	-	-	-	19600.0	-	-	-
7	17530.0	25400.0	39000.0	32200.0	9616.6	43000.0	38000.0	-	-	23600.0	27000.0	25300.0	2404.2
14	25700.0	53900.0	-	-	-	81700.0	-	-	-	63100.0	-	-	-
21	31900.0	78000.0	-	-	-	82700.0	-	-	-	84400.0	-	-	-

Effect of Annealing

I13 Data for η_o vs. aging time of the BTAC/FA = 1.0/2.0. (Figure 3.54)

Time (day)	η_o (P)												
	26 °C	**40 °C**				**53 °C**				**80 °C**			
	Set 1	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.
1	3700.0	255.0	163.0	209.0	65.0	224.0	229.0	226.5	3.53	69.2	86.0	77.6	11.9
2	2950.0	216.0	-	-	-	240.0	-	-	-	113.0	-	-	-
3	2820.0	284.0	-	-	-	325.0	287.0	306.0	26.9	176.0	-	-	-
4	2660.0	260.0	-	-	-	325.0	-	-	-	208.0	-	-	-
5	2310.0	290.0	-	-	-	339.0	-	-	-	277.0	-	-	-
7	2820.0	516.0	313.0	414.5	143.5	345.0	379.0	362.0	24.0	311.0	433.0	372.0	86.3
14	2860.0	896.0	822.0	859.0	52.3	738.0	615.0	676.5	87.0	478.0	666.0	572.0	132.9
21	1940.0	803.0	-	-	-	750.0	-	-	-	537.0	-	-	-

Effect of Annealing

I14 Data for η_o vs. aging time of the BTAC/FA = 1.0/4.0. (Figure 3.55)

Time (day)	η_o (P)													
	26 °C	40 °C				53 °C				80 °C				
	Set 1	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.	Set 1	Set 2	Mean	Std.
1	23500.0	22700.0	22900.0	22800.0	141.4	22400.0	21400.0	21900.0	707.1	14600.0	15700.0	15150.0	777.8
2	23500.0	20400.0	-	-	-	22100.0	-	-	-	17200.0	-	-	-
3	22600.0	18700.0	-	-	-	21500.0	-	-	-	18000.0	-	-	-
4	22800.0	19600.0	-	-	-	20200.0	-	-	-	18300.0	-	-	-
5	21800.0	19400.0	-	-	-	20700.0	-	-	-	18300.0	-	-	-
7	20800.0	18300.0	17600.0	17950.0	494.9	19400.0	23700.0	21550.0	3040.6	19600.0	20100.0	19850.0	353.5
14	19300.0	23100.0	18600.0	21000.0	2969.8	20900.0	19800.0	20350.0	777.8	21600.0	23700.0	22650.0	1484.9
21	20700.0	22600.0	-	-	-	20200.0	-	-	-	22800.0	-	-	-

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