



Supplementary Materials

Table S1. Variance analysis for dielectric constant.

Source	DF	Seq SS	Adj SS	Adj MS	F	P-Value
W _{CA} (%)	2	0.019957	0.019957	0.009978	30.53	0.032
Infill (%)	2	0.197962	0.197962	0.098981	302.8	0.003
Thickness (mm)	2	0.009617	0.009617	0.004809	14.71	0.064
Residual Error	2	0.000654	0.000654	0.000327		
Total	8	0.228189				

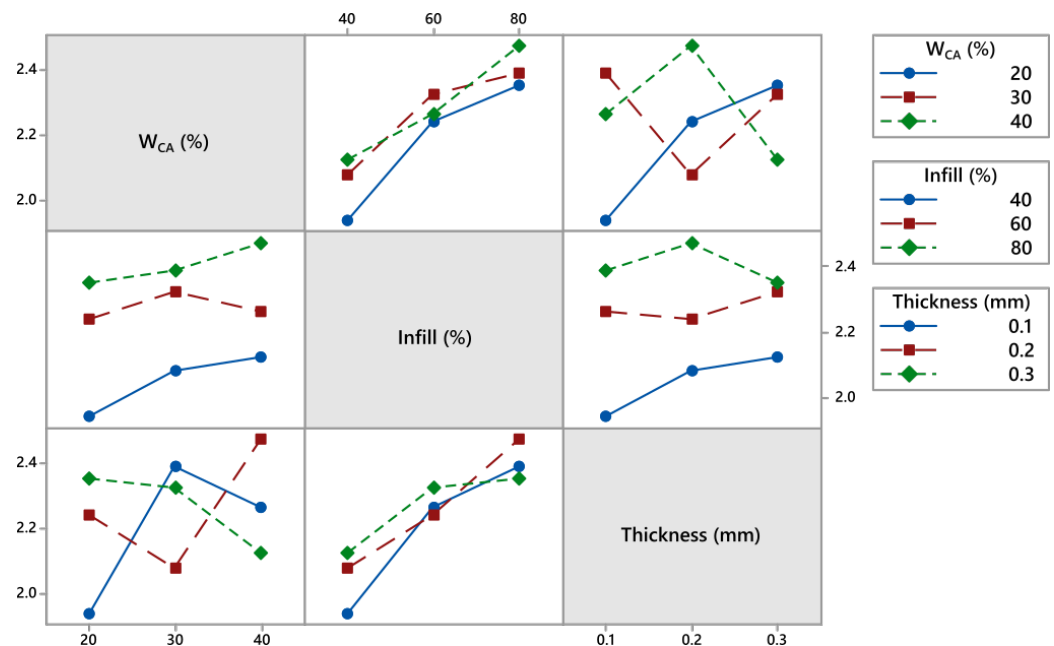


Figure S1. Interaction plots for dielectric constant.

Table S2. Response table for dielectric constant.

Level	W _{CA} (%)	Infill (%)	Thickness (mm)
1	2.179	2.048	2.198
2	2.265	2.278	2.266
3	2.288	2.407	2.269
Delta	0.109	0.359	0.071
Rank	2	1	3

Table S3. Variance analysis of log (electrical conductivity).

Source	DF	Seq SS	Adj SS	Adj MS	F	P-Value
W _{CA} (%)	2	0.034228	0.034228	0.017114	29.91	0.032
Infill (%)	2	0.088931	0.088931	0.044466	77.72	0.013
Thickness (mm)	2	0.005803	0.005803	0.002902	5.07	0.165
Residual Error	2	0.001144	0.001144	0.000572		
Total	8	0.130107				

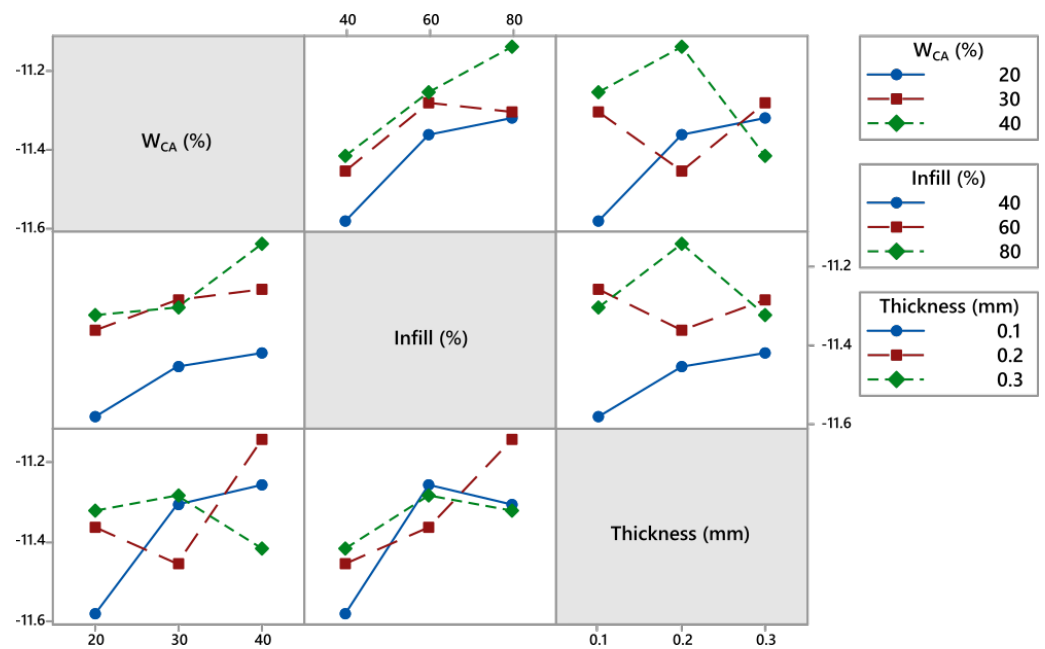


Figure S2. Interaction plots for log (electrical conductivity).

Table S4. Response table for log (electrical conductivity).

Level	W _{CA} (%)	Infill (%)	Thickness (mm)
1	-11.1668	-11.2296	-11.1251
2	-11.0918	-11.0451	-11.0638
3	-11.0158	-10.9997	-11.0854
Delta	0.1511	0.2299	0.0613
Rank	2	1	3

Table S5. : Notable temperature for PLA:CA blends. measured by DSC at 10K·min⁻¹.

	T _g PLA (cool)	T _g PLA (heat)	T _{cc} PLA	T _f PLA	X _{cr} (%)
PLA	52.6 ± 0.9	61.7 ± 0.4	127.6 ± 0.1	154.2 ± 0.6	0.7
CA-10	46.4 ± 0.2	56.4 ± 0.7	122.9 ± 1.1	152.4 ± 0.5	> 0.5
CA-20	41.4 ± 0.1	51.6 ± 0.4	120.6 ± 0.6	150.2 ± 0.2	> 0.5
CA-30	35.1 ± 0.9	47.1 ± 1.2	117.3 ± 1.2	148.9 ± 1.0	> 0.5
CA-40	31.3 ± 1.5	41.1 ± 1.5	110.8 ± 1.4	145.9 ± 0.4	> 0.5

Table S6. Variance analysis of storage modulus at 30°C (@ 1 Hz).

Source	DF	Seq SS	Adj SS	Adj MS	F	P
W _{CA} (%)	2	104368	104368	52184	8.69	0.103
Infill (%)	2	52391	52391	26195	4.36	0.186
Thickness (mm)	2	28730	28730	14365	2.39	0.295
Residual Error	2	12010	12010	6005		
Total	8	197499				

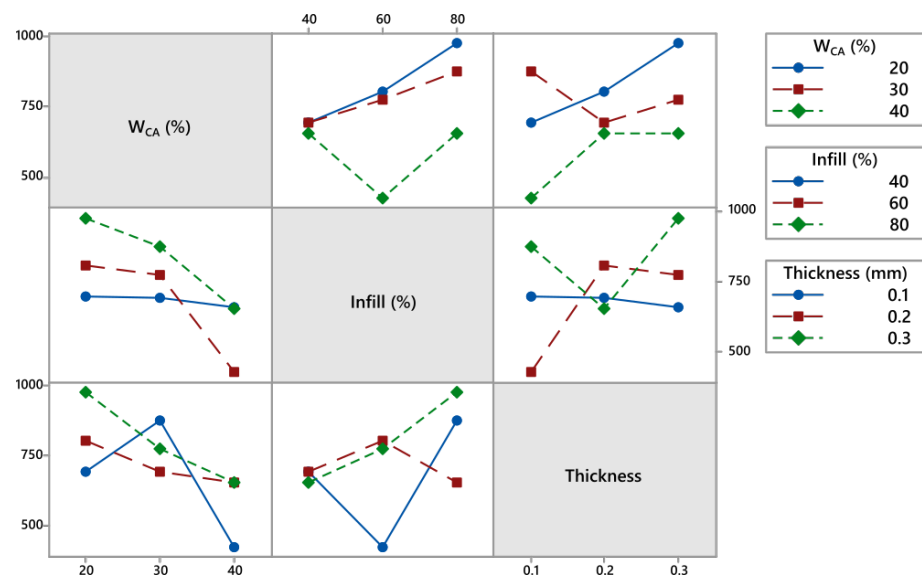


Figure S3. Interaction plots for storage modulus.

Table S7. Response table for storage modulus.

Level	W _{CA} (%)	Infill (%)	Thickness (mm)
1	825.6	680.9	665.5
2	781.4	668.3	717.4
3	578.3	836.1	802.5
Delta	247.3	167.8	137.1
Rank	1	2	3

Table S8. Variance analysis of PLA's glass transition temperature (@ 1 Hz).

Source	DF	Seq SS	Adj SS	Adj MS	F	P
W _{CA} (%)	2	179.336	179.336	89.6678	180.14	0.006
Infill (%)	2	0.642	0.642	0.3211	0.65	0.608
Thickness (mm)	2	0.576	0.576	0.2878	0.58	0.634
Residual Error	2	0.996	0.996	0.4978		
Total	8	181.549				

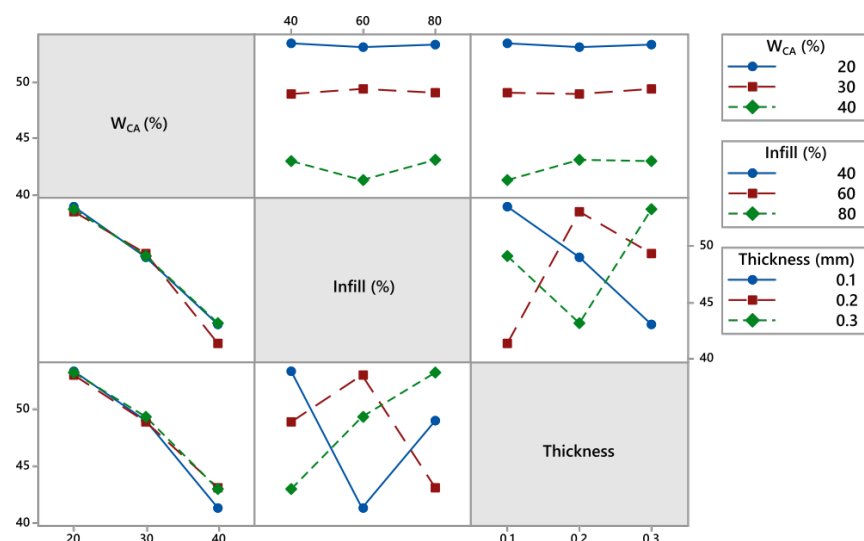


Figure S4. Interaction plots for glass transition temperature of PLA.