

Supplementary information

Chemical property evaluation and tensile strength correlation of XLPE insulators based on accelerated thermal aging

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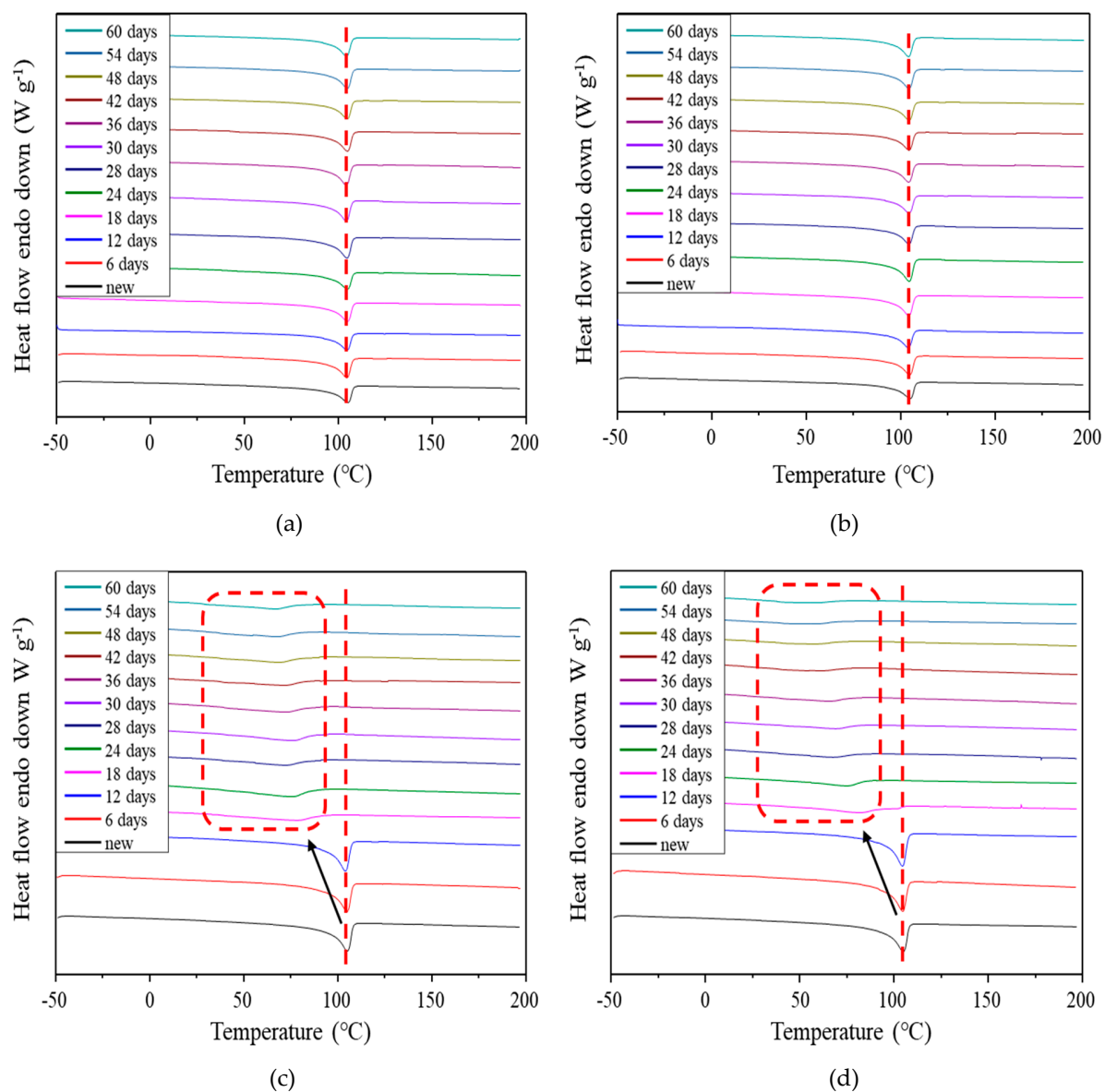


Figure S1. DSC heating thermograms of XLPE samples depending on aging time and temperature: (a) 100 $^{\circ}\text{C}$, (b) 120 $^{\circ}\text{C}$, (c) 140 $^{\circ}\text{C}$, and (d) 160 $^{\circ}\text{C}$.

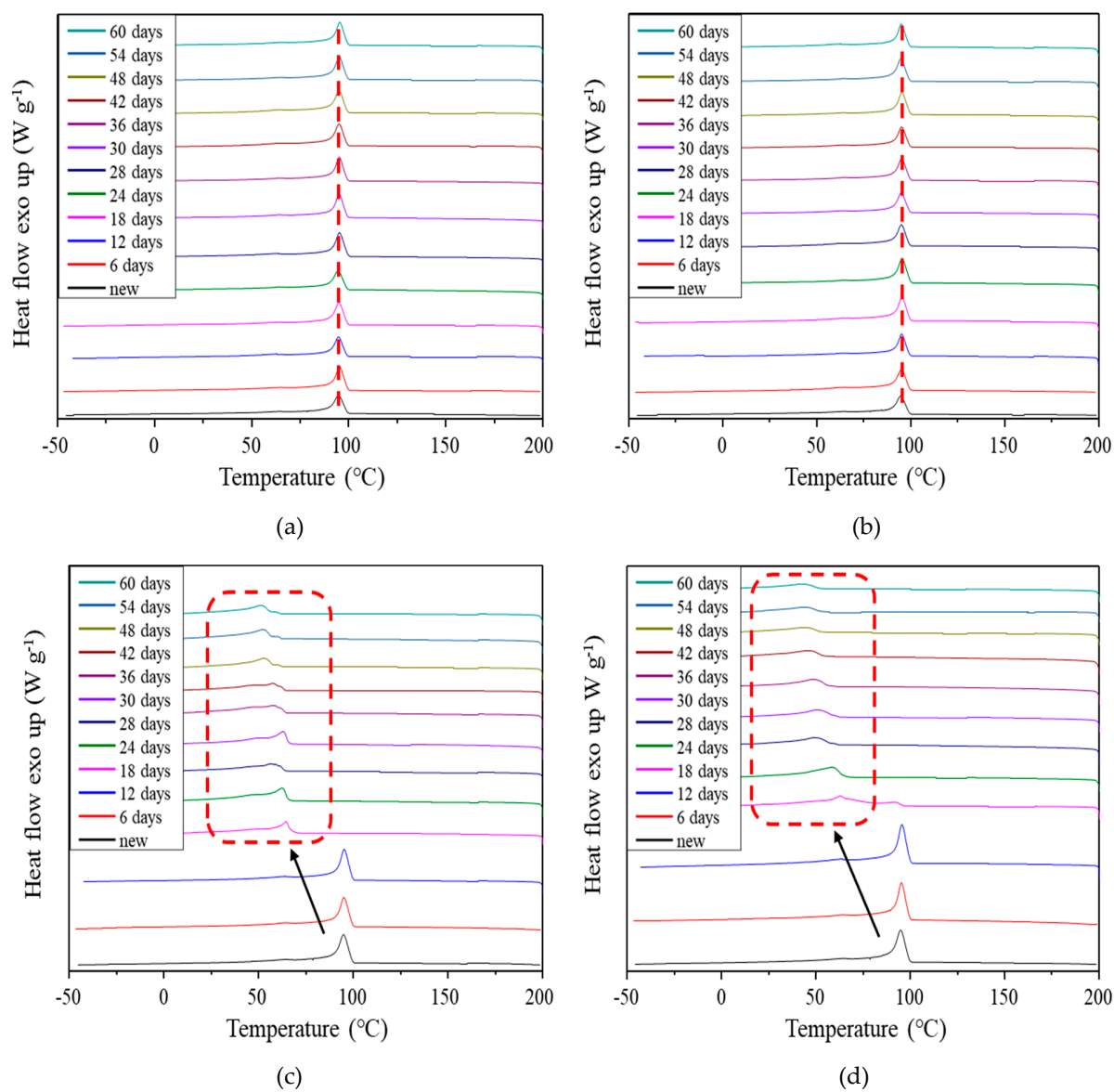


Figure S2. DSC cooling thermograms of XLPE samples based on aging time and temperature: (a) 100 $^{\circ}\text{C}$, (b) 120 $^{\circ}\text{C}$, (c) 140 $^{\circ}\text{C}$, and (d) 160 $^{\circ}\text{C}$.

Table S1. The correlation parameters between tensile strength and factors.

Factor		Linear correlation $y = ax + b$			Nonlinear correlation $y = y_0 + Ae^{R_0x}$			
		Slope (a)	Intercept (b)	R^2	y_0	A	R_0	R^2
Degree of crystallinity (%)	XRD	0.6012	-0.9287	0.8747	-144.8360	144.4418	0.0038	0.8721
	DSC	0.5123	1.7047	0.8323	90.1234	-89.0333	-0.0066	0.8296
Carbonyl index	CI-1	-2.8910	21.9396	0.9214	-7.552	30.7712	-0.1456	0.9299
	CI-2	-33.9917	21.1087	0.8808	0.7634	22.6265	-3.2574	0.9221
Yellowness index	ASTM D1925	-0.0920	24.4677	0.8412	-0.2756	31.4387	-0.0080	0.8695
	T_m (°C)	0.3302	-15.0430	0.8967	-2.6902	2.0859	0.0227	0.9121
	T_c (°C)	0.2490	-4.2002	0.7963	-579.9495	576.0074	0.0004	0.7917
	Lamellar thickness (nm)	3.6550	-6.7180	0.9250	-36.0981	32.5561	0.0747	0.9244
	Band gap (eV)	11.1839	-17.8268	0.8386	33.4518	-104.9198	-0.6071	0.8581
	Degree of swelling (%)	22.1984	-0.2981	0.8090	4.9248	28.3420	-0.0582	0.8888