Sustainable TPS/PBAT Biocomposites Tailored with Epoxidized Soybean Oil for Improved Mechanical Properties

Supplementary Information:

Table S1: Elemental and rheological analysis of Oil

%	C	H	N	S	O	Viscosity (cP)	Density (g/cc)
SO	80.49	12.79	0.43	0.002	7.39	572 ± 20	0.878
EPSO	68.41	9.80	0.57	0.002	24.32	3760 ± 45	0.938

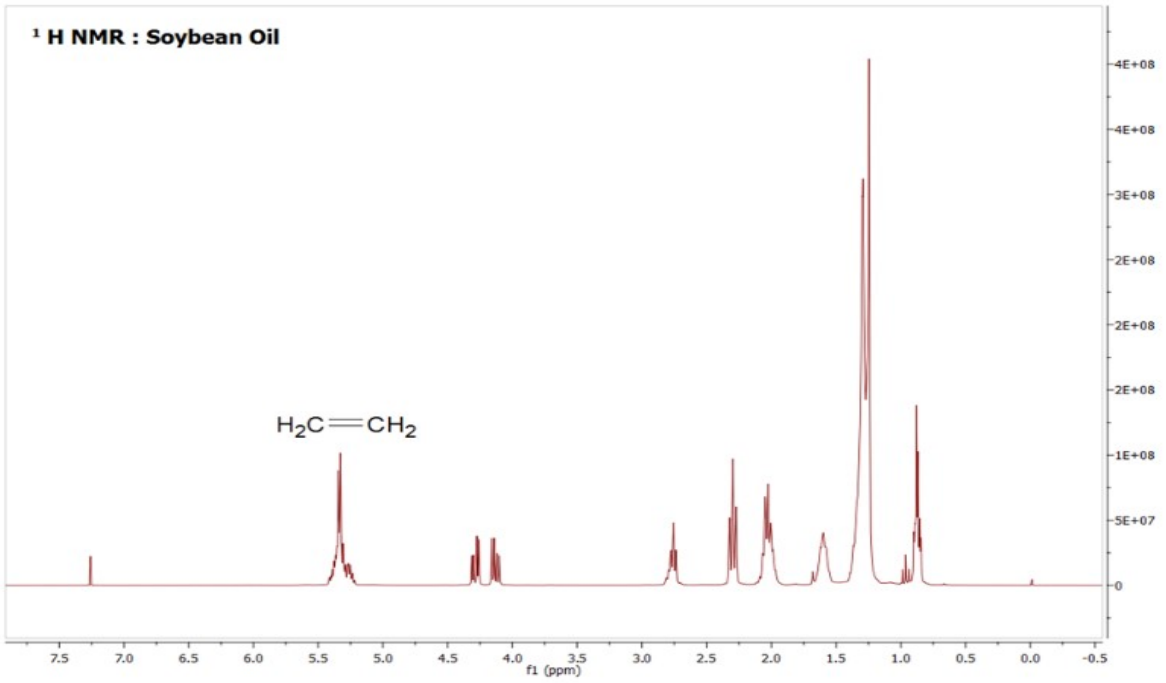
Table S2: Mechanical Properties of Composite Thin Films

	MFI (190 °C/2.16 kg)	Tensile Strength (MPa)	Elongation at Break (%)	Burst Capacity (psi)
	ASTM D-1238	**ASTM D882-02**		**ASTM F1140-00**
TPS-PBAT	5.35 ± 0.83	9.08 ± 0.89	375 ± 24	14 ± 2
TPS-G30-E0-PBAT	5.52 ± 0.74	6.21 ± 0.64	426 ± 16	13 ± 3
TPS-G25-E5-PBAT	6.86 ± 0.66	5.63 ± 0.32	379 ± 29	14 ± 2
TPS-G20-E10-PBAT	7.72 ± 0.39	13.63 ± 0.81	299 ± 18	16 ± 2
TPS-G15-E15-PBAT	8.95 ± 0.54	11.55 ± 0.35	325 ± 26	15 ± 3
TPS-G10-E20-PBAT	5.88 ± 0.71	Didn't Blow Properly		

Table S3: Barrier Properties of Composite Thin Films

	Water Vapor Permeability (WVP) ($g.m^{-2}.day.cm.bar^{-1}$)	Water Contact Angle (WCA)
	ASTM E96-E96M	**-**
TPS-PBAT	190.23 ± 2.78	69.7 ± 0.40
TPS-G30-E0-PBAT	142.65 ± 1.97	95.3 ± 0.44
TPS-G25-E5-PBAT	138.97 ± 3.08	104.6 ± 0.51
TPS-G20-E10-PBAT	125.22 ± 4.95	106.5 ± 0.39

TPS-G15-E15-PBAT	117.09 ± 3.88	108.6 ± 0.46



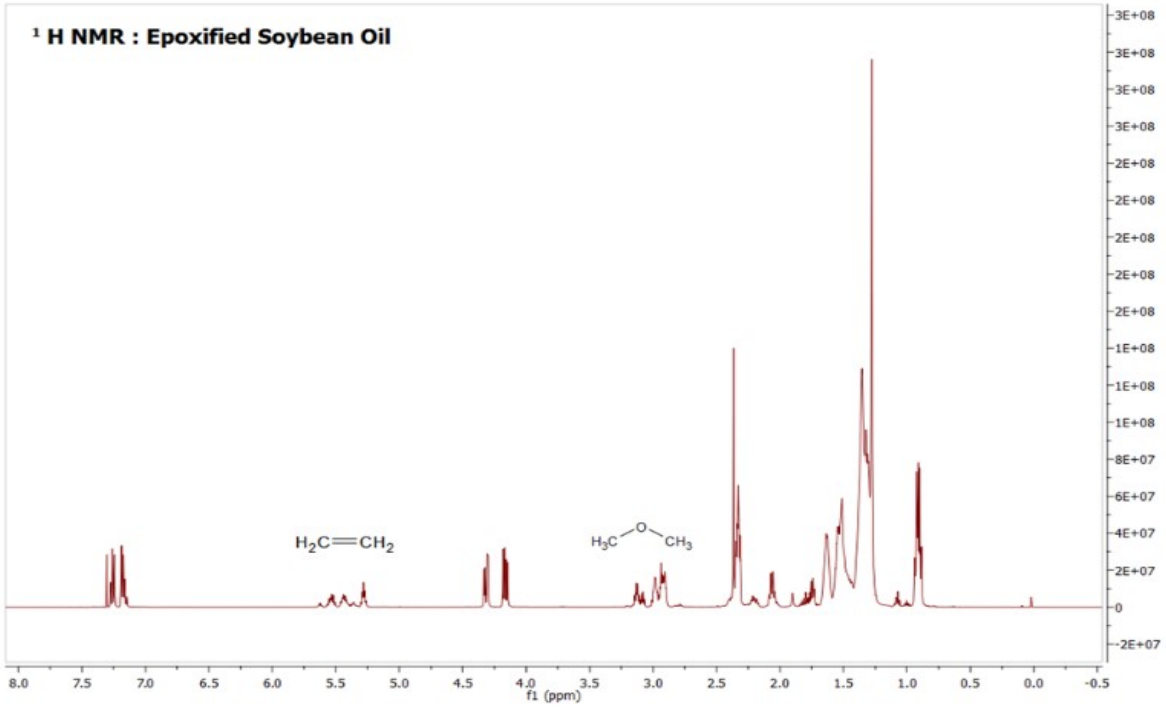


Figure S1 (a): ^{1}H NMR spectra of

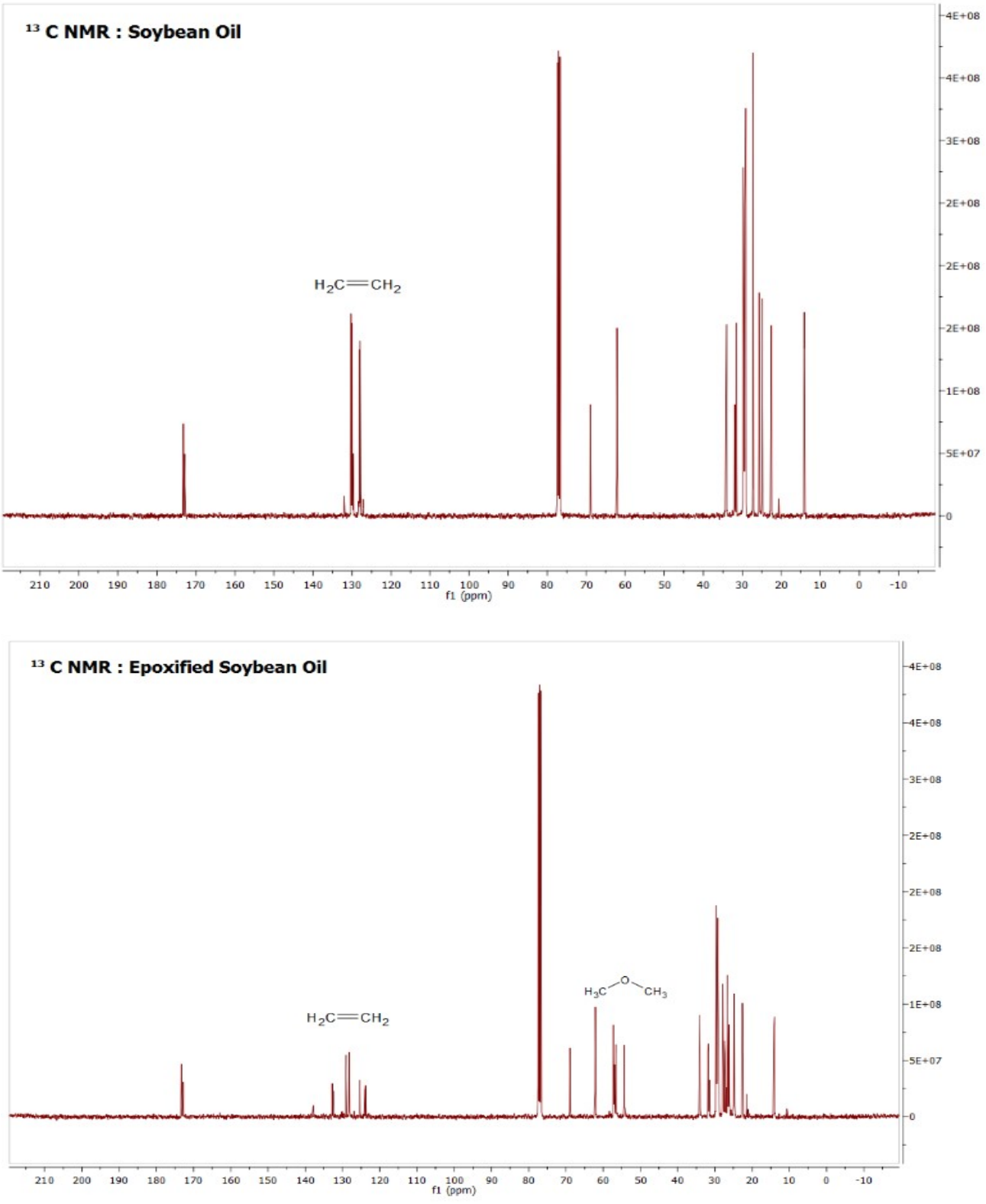


Figure S1 (b): ^{13}C NMR spectra of oils