Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

A Comparison of Adhesive Polysulfides Initiated by Garlic Essential Oil and Elemental Sulfur to Create Recyclable Adhesives

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Figure S1: Adhesion strength of poly(S-GEO-myrcene) made with 70% myrcene, 0-30% garlic essential oil (GEO) and the remainder being elemental sulfur (S_8).

Figure S2: ^{1}H NMR of polysulfides made with 50% linalool and the remaining 50% composed of various S:GEO ratios in chloroform-*d*.

Figure S3: ^{1}H NMR of poly(GEO-linalool) compared to poly(DADS-linalool) in chloroform-*d*.

Figure S4: HSQC NMR of garlic essential oil (GEO) in chloroform-*d*.

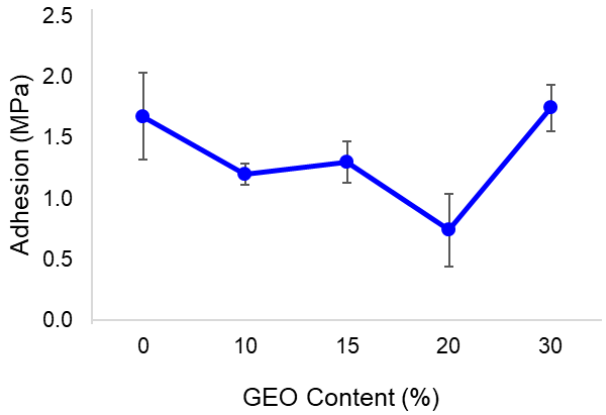
Figure S5: HSQC NMR of poly(GEO-linalool) in chloroform-*d*.

Figure S6: Differential scanning calorimetry of polysulfides made with 50% linalool and the remaining 50% composed of various S:GEO ratios.

Figure S7: Qualitative reprocessing analysis of poly(S-GEO-linalool) made with 50% linalool and the remaining 50% composed of various S:GEO ratios before (left) and after (right) curing at 160 °C for 30 min.

Table S1: Adhesion strength of polysulfides formed with elemental sulfur versus garlic essential oil (GEO) with a variety of monomers.

Table S2: A comparison of maximum adhesion strength to the work of adhesion for poly(S-GEO-linalool) with varied the S:GEO ratios.



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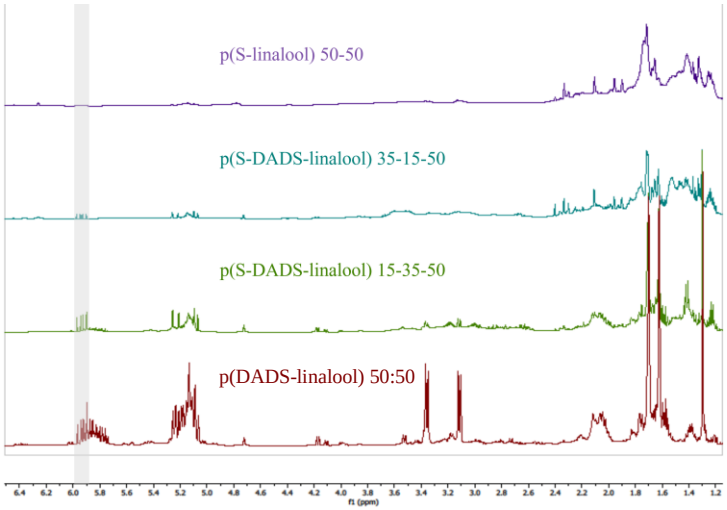

Figure S2: ^{1}H NMR of polysulfides made with 50% linalool and the remaining 50% composed of various S:GEO ratios in chloroform-*d*.

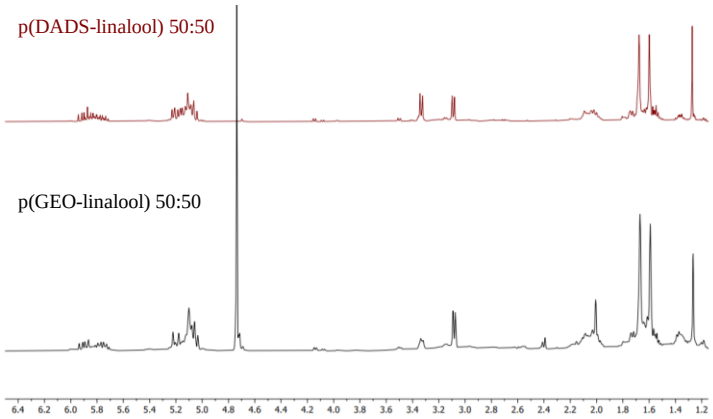

Figure S3: ^{1}H NMR of poly(GEO-linalool) compared to poly(DADS-linalool) in chloroform-*d*.

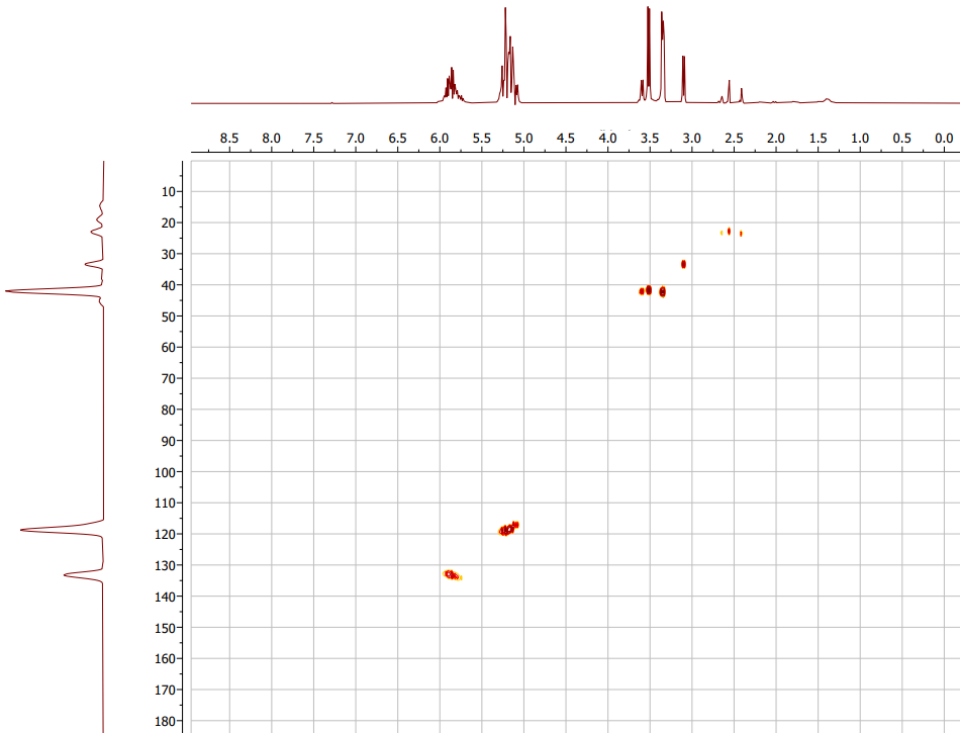

Figure S4: HSQC NMR of garlic essential oil (GEO) in chloroform-*d*.

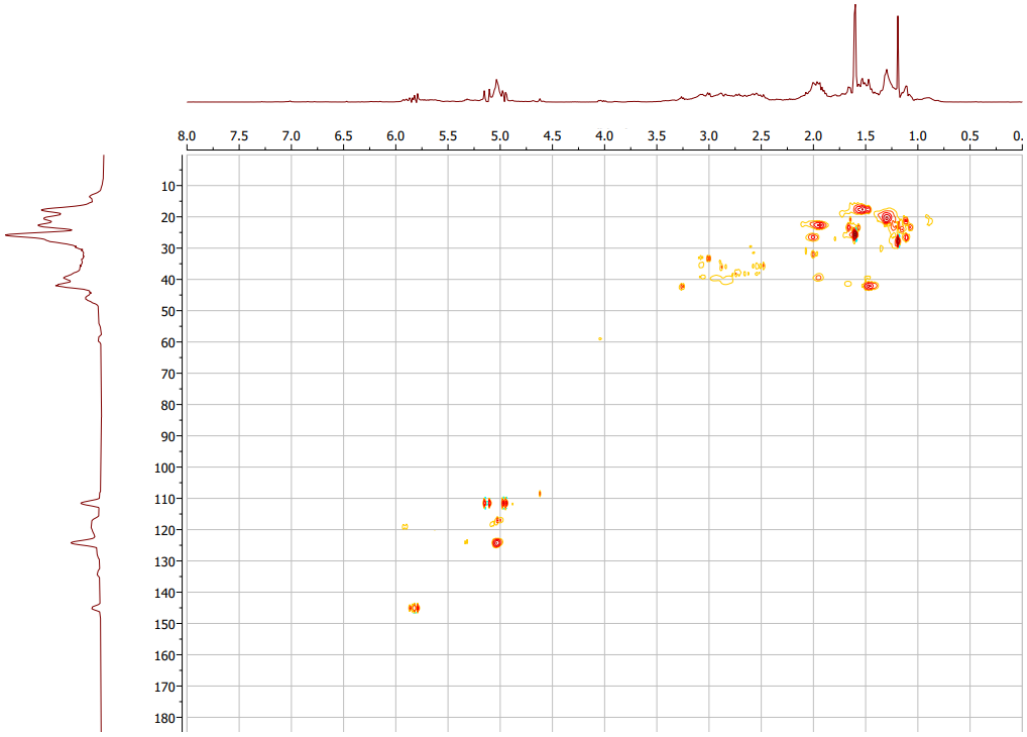

Figure S5: HSQC NMR of poly(GEO-linalool) in chloroform-*d*.

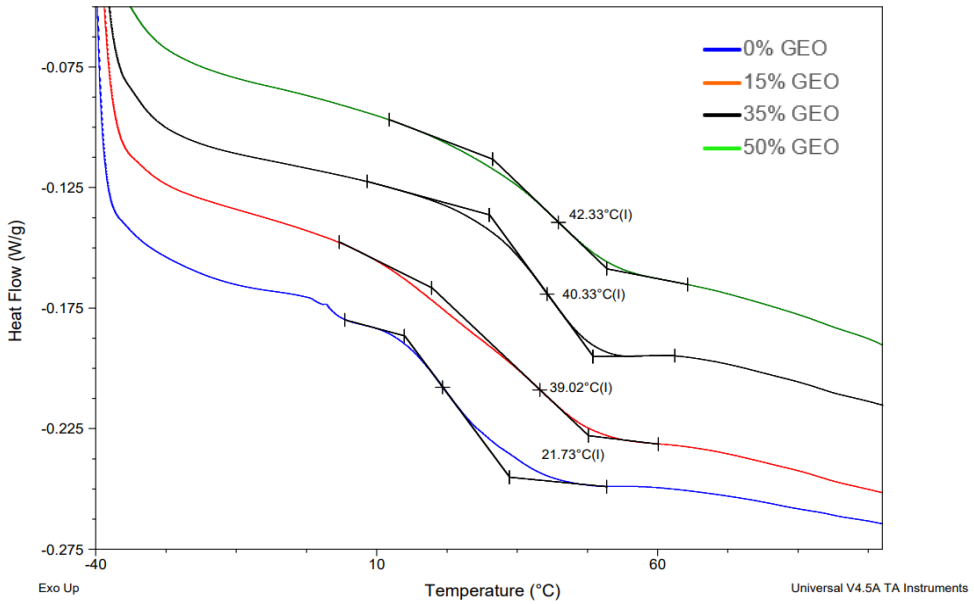

Figure S6: Differential scanning calorimetry of polysulfides made with 50% linalool and the remaining 50% composed of various S:GEO ratios.

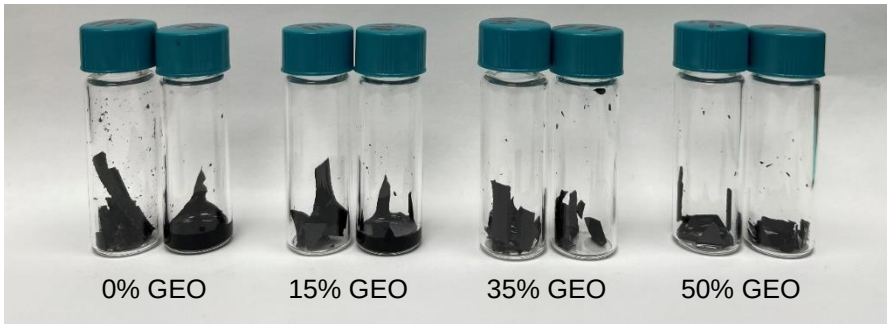

Figure S7: Qualitative reprocessing analysis of poly(S-GEO-linalool) made with 50% linalool and the remaining 50% composed of various S:GEO ratios before (left) and after (right) curing at 160 ℃ for 30 min.

Table S1: Adhesion strength of polysulfides formed with elemental sulfur versus garlic essential oil (GEO) with a variety of monomers.

	Maximum Adhesion Strength (MPa)	
Monomer	Elemental Sulfur	GEO
GEO	1.91 ± 0.19	0.68 ± 0.11
limonene	0.88 ± 0.49	1.32 ± 0.43
linalool	0.45 ± 0.13	1.78 ± 0.44
myrcene	1.72 ± 0.43	1.74 ± 0.11
dicyclopentadiene	0.93 ± 0.23	2.11 ± 0.44

Table S2: A comparison of maximum adhesion strength to the work of adhesion for poly(S-GEO-linalool) with varied the S:GEO ratios.

GEO Content	Work of Adhesion (mJ)	Adhesion (MPa)
0	121 ± 12	0.63 ± 0.24
15	72 ± 26	0.78 ± 0.18
35	53 ± 16	0.73 ± 0.16
50	35 ± 5	0.99 ± 0.11

Terpolymers all contain 50% linalool by weight.