Electronic Supplementary Information for:

Copolymerization of an Aryl Halide and Elemental Sulfur as a Route to High Sulfur Content Materials

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Materials	C wt%	H wt%	S wt%	Cl wt%
XS81	16.3	0.4	80.7	0.7
CS ₂ insoluble fraction of XS81	37.1	1.2	52.8	1.1
DDP	50.2	4.2	0.0	37.2

Table S1. Elemental Analysis of XS81, CS2 Insoluble Fraction of XS81 and DDP monomer



Figure S1. IR spectra of pure DDP



Figure S2. IR Spectra of **XS81** (blue solid line) and CS_2 insoluble fraction (orange solid line) showing characteristic peaks originated from DDP monomer and the emergence of the C–S stretching at 605-620 cm⁻¹.



Figure S3. DMA data of XS81



Figure S4. The average stress-strain curve of three XS81 samples.

Electron Image 6



100µm

Figure S5. Surface analysis of **XS81** by scanning electron microscopy (SEM) revealed a smooth surface consistent with those observed in high sulfur-content materials prepared by inverse vulcanization.





100µm

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B)

C)



Figure S7. Elemental analysis **XS81** from SEM-EDX surface analysis revealed that the elemental composition of the surface is consistent with the bulk composition determined from combustion analysis.