Supporting Information

Sprayable Elastic Conductors Based on Block Copolymer Silver Nanoparticle Composites

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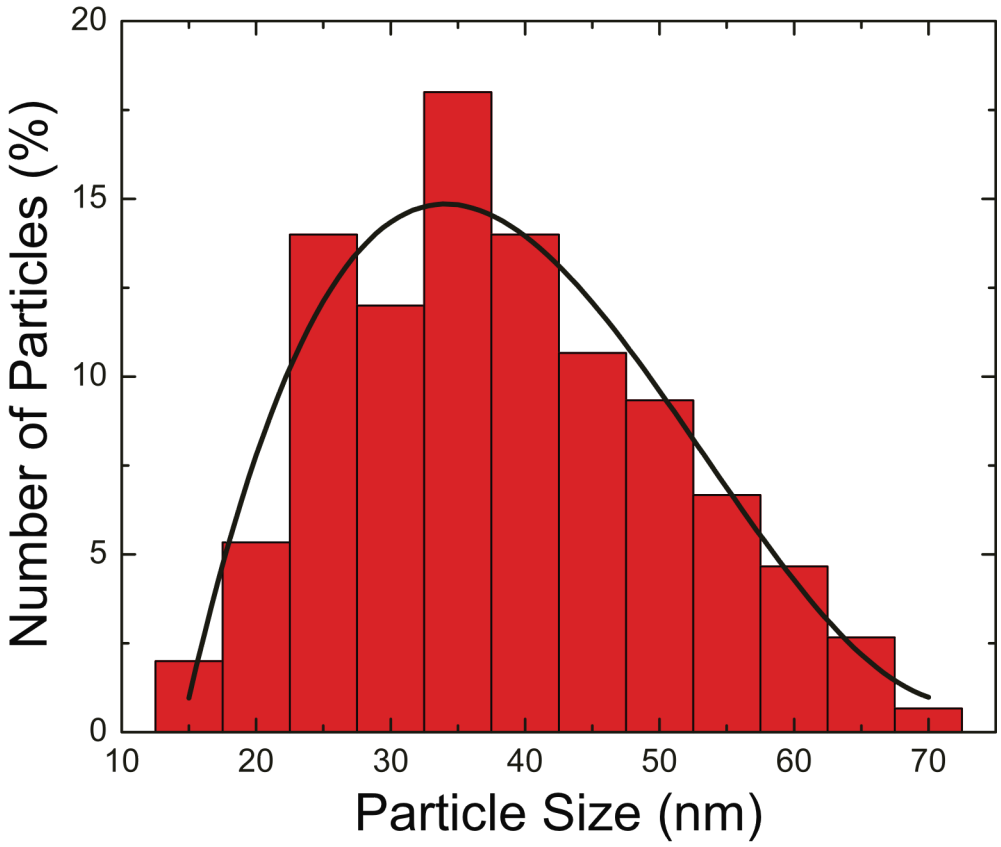

Figure S1. Nanoparticle size distribution as measured by TEM (n=150).

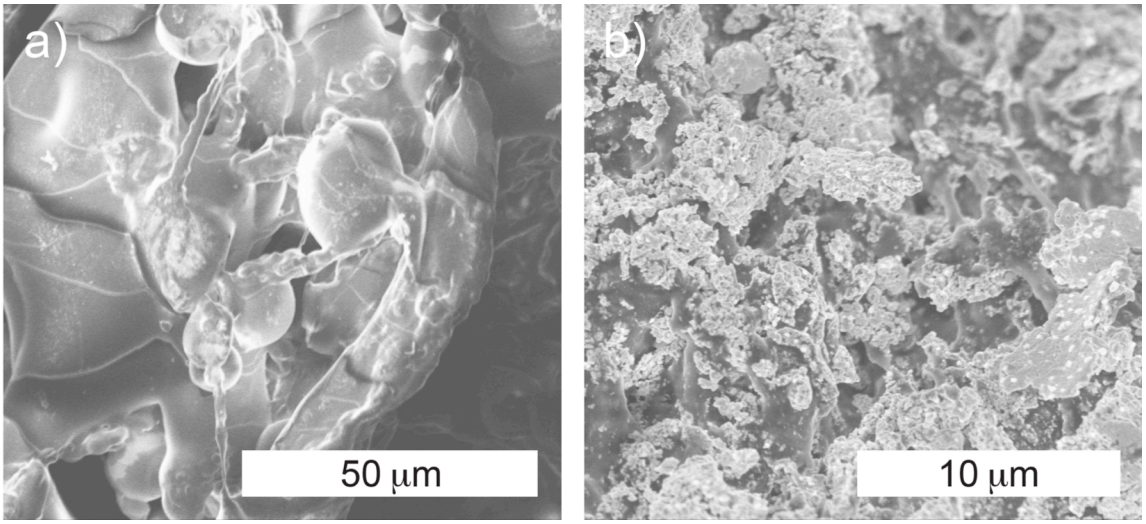

Figure S2. Fiber structure was irreversibly lost during the fabrication process for SIS block copolymers with a styrene weight percentage lower than 22%. a) SEM image of solution blow spun polymer network of low styrene content SIS (14 wt% styrene) after being swollen with 25% (wt/vol) STFA solution, showing loss of fiber morphology. b) SEM image of the same polymer network after silver nanoparticle nucleation.

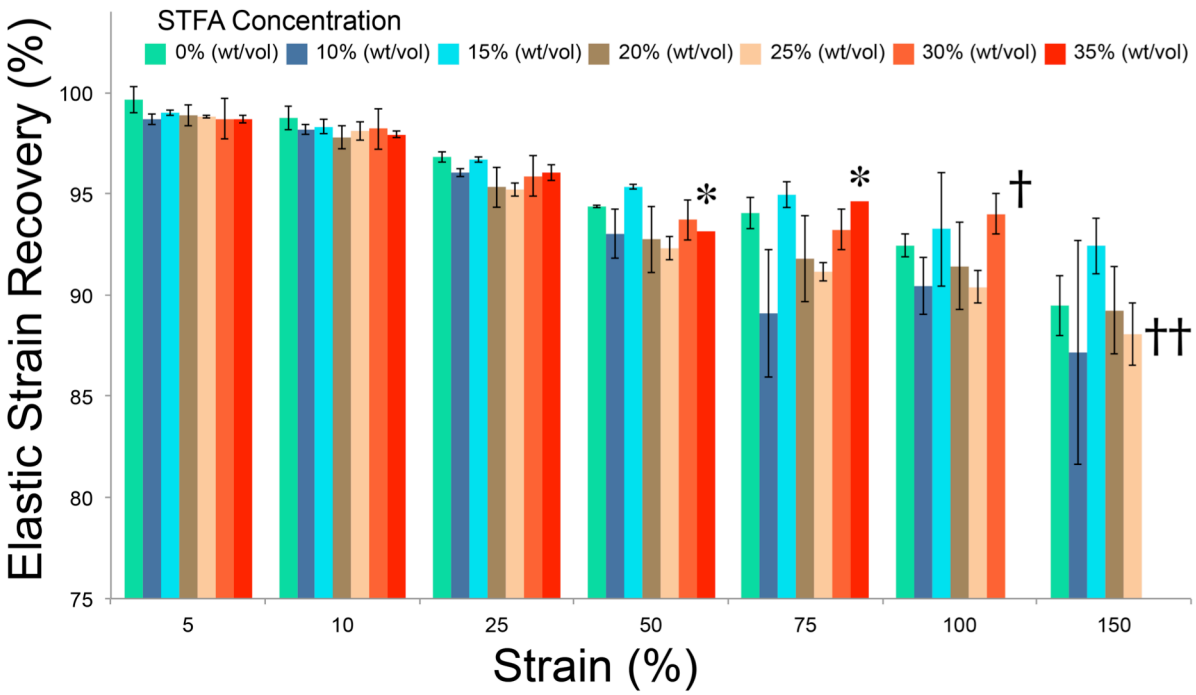

Figure S3. Elastic recovery of SIS fiber mats and stretchable conductors fabricated from different precursor concentrations after consecutive strain cycling to increasing maximum strain values. (*) Indicates that 2 of 3 samples failed during that strain cycle for a specific experimental group. (†) Indicates that all of the samples have failed. (n=3) for all groups, error bars represent standard deviation.

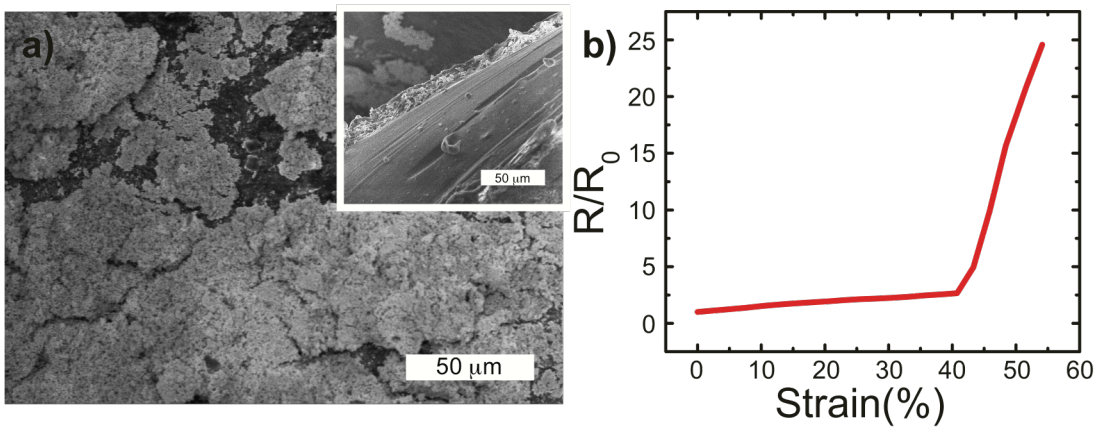

Figure S4. a) SEM image of a drop cast SIS film nucleated with 25% (wt/vol) STFA solution (SEM image of cross section-inset). Silver nanoparticles were only formed on the outer surface of the film in a similar manner to individual SIS fibers. b) Normalized resistance values versus strain for polymer film silver nanoparticle composites. Resistance values increase by 25 fold at 50% strain and subsequently fail, showing the importance of the influence of fiber structure on electromechanical properties.

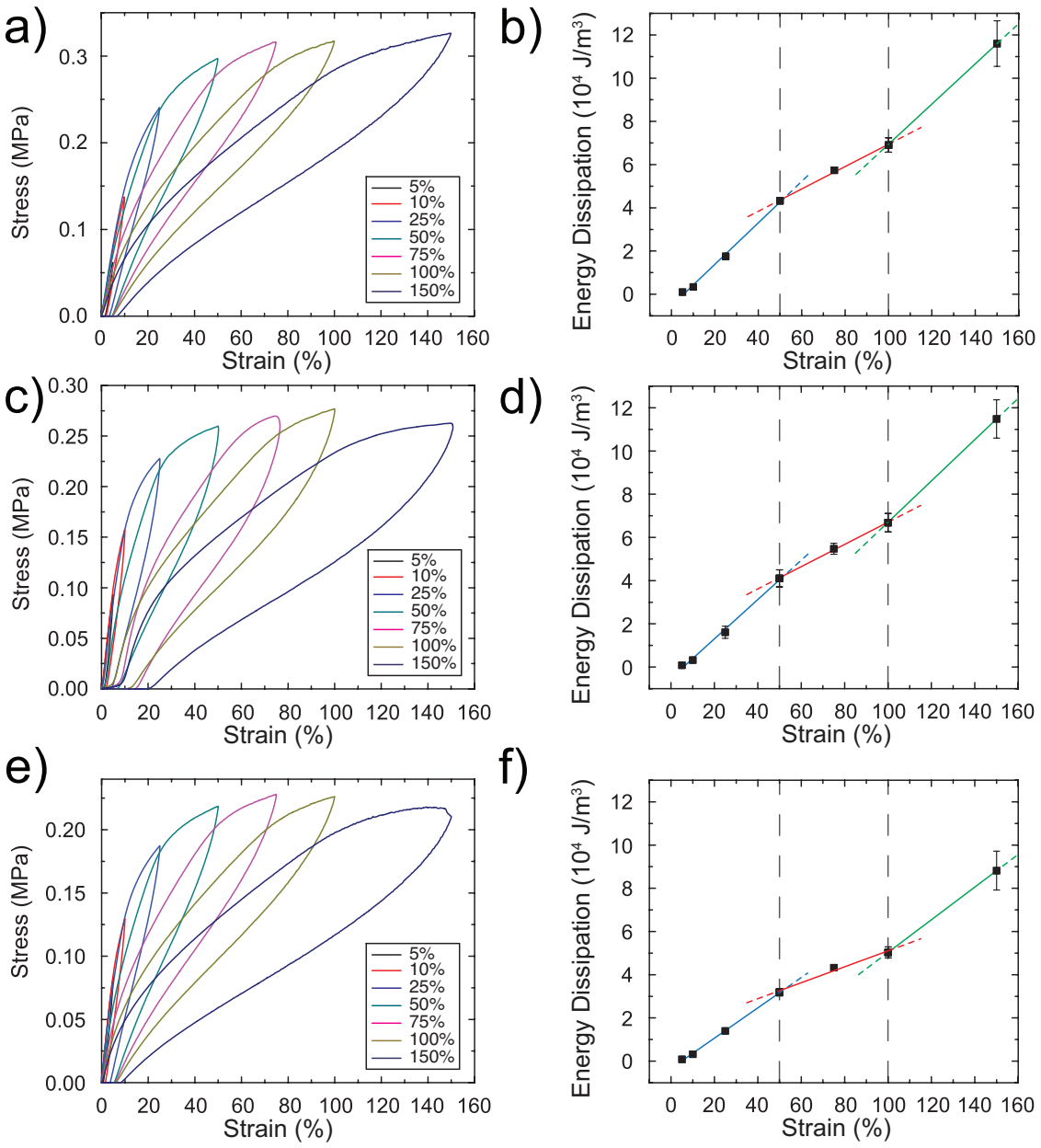

Figure S5. a,c,e) Stress/strain cycling curves and b,d,f) energy dissipation values and corresponding linear fits for stretchable conductors fabricated with 10%, 15%, and 20% (wt/vol) STFA solution, respectively (n=3). Error bars represent standard deviation. Linear correlations relating energy dissipation to strain describe different regions of strain induced structural changes (blue, red, and green lines).

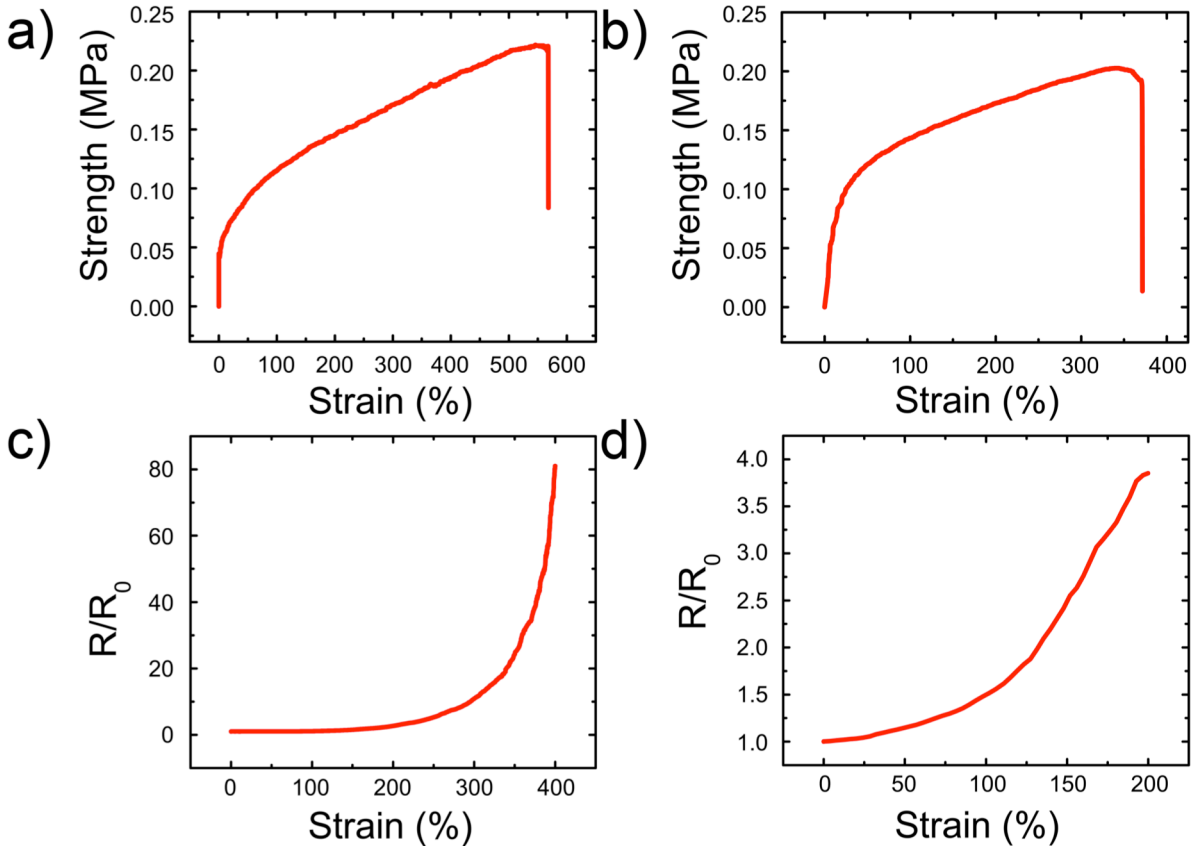

Figure S6. Stress/strain curves for a) elastomeric fiber mats, b) conductive composites fabricated with 25% (wt/vol) solutions. Normalized resistance values of c) bulk and d) line patterns of conductive composites fabricated with 25% (wt/vol) STFA solutions. The bulk conductors failed between 370% and 400% strain, remaining conductive until mechanical failure.