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**Disordered bicontinuous nanostructures from randomly end-linked copolymer networks** RYAN HAYWARD, University of Massachusetts Amherst — Self-assembly within randomly cross-linked copolymer networks can provide co-continuous nanometer-scale structures in a wide variety of material systems. Copolymer networks prepared by end-linking pairs of telechelic polymers in a common solvent are particularly attractive in this regard as systems with well-defined and easily tuned network parameters. For sufficiently high levels of immiscibility between the constituent polymers, removal of solvent leads to microphase separation into disordered nanoscale structures. Using copolymer networks with a glassy strand and an ion-conducting strand, we have found that disordered morphologies with well-percolated domains of both phases persist across a wide range of compositions of the two materials. Similarly, by including a degradable component, we have found that interpenetrating porous structures are formed over a wide range of loading. These materials show a narrow distribution of pore sizes that can be tuned by adjusting the molecular weight of the starting polymers.

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