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Organogels from Polypeptide-based Block Copolymers DANIEL SAVIN, DANIEL BERCOVICI, SANDEEP NAIK, Department of Chemistry, University of Vermont — A series of AB diblock and ABA triblock copolymers consisting of poly(Lysine(Z)) (A = P(Lys(Z))) and poly(propylene oxide) (B = PPO) were synthesized and found to form stable, rigid organogels in THF (ca. 1 1.5 wt.% solutions) at room temperature. In these systems, the protecting group on the P(Lys) sidechains remains intact. As such, the secondary structure of the polypeptide chains retains its helicity over a wide range of solution conditions. Gel formation in these systems results from the assembly of the solventphobic P(Lys(Z)) chains, which pack densely in an anti-parallel fashion, minimizing interfacial curvature. These gels all exhibited shear-thinning behavior, and as the temperature was heated to 77°C exhibited a gel-sol transition. The gels formed over a time scale of about 10 minutes and had a modulus on the order of 55 Pa. The molecular weight dependence of the gel formation and rheological properties was studied in THF, dioxane and toluene.

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