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Physical Properties of Anionic Peptide Amphiphile Fibers Grown in the Presence of Polyion Salt MEGAN GREENFIELD, YURI VELICHKO, SAMUEL STUPP, MONICA OLVERA DE LA CRUZ, Northwestern University — We analyze the structure and mechanical properties of self-assembled gels formed by anionic peptide amphiphiles (PA) in the presence of cationic peptides and polyion salt. The PA molecules, which are composed of a hydrophobic alkyl tail, a beta-sheet forming region, and a hydrophilic epitope region, self-assemble into cylindrical micelles in water with multivalent salt. The fibers grow in one dimension by forming an internal beta sheet along the middle segment; the hydrophobic tail hides inside the fiber and the epitope region is exposed on the surface. Rheology and electron microscopy are used to investigate the physical properties of the resulting PA gels. The PA-fibers form a self-supporting gel at a concentration of one weight percent. Our experimental results show a strong dependence on the nature and valency of the polyions. We will present a theoretical model that incorporates both PA self-assembly and gelation of PA-fibers in the presence of polyion salt.

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