

Abstract Submitted
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Electrospinning Solutions of Associating Polymers – the Case of Stereocomplex PMMA¹ MATIJA CRNE, JUNG PARK, MOHAN SRINIVASARAO, Georgia Institute of Technology — A mixture of isotactic and syndiotactic PMMA polymers (also called a “stereocomplex PMMA”) forms a supramolecular helical structure, which is held together by non-covalent bonding. This association is thermoreversible and solvent-sensitive. If the concentration of stereocomplex PMMA is high enough, the solutions form thermoreversible physical gels. We have examined the influence this associating behavior has on the process of electrospinning. In our work, we have used solutions of stereocomplex PMMA to study the effect of physical gelation interaction on the fiber morphology and compared it to the solutions of atactic PMMA of similar molecular weight. We have found that the stereocomplex PMMA solutions do not follow the same empirical rules that are applicable for linear polymers in solution. Instead, the concentration necessary for the production of smooth, continuous fibers is much lower. We ascribe this extraordinary behavior to the ability of these polymers to associate and form a network during the electrospinning process. The elasticity of the fluid jet thus rises and results in a more stable jet. The resulting fibers are interesting, as they have greater temperature stability than regular atactic PMMA. Therefore they have a bigger processing window for making composites with better mechanical properties.

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