

Abstract Submitted
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Amyloid fibril networks nucleated under oscillatory shear KIERSTEN BATZLI, BRIAN LOVE, Department of Materials Science and Engineering, University of Michigan — The process of amyloid fibril formation is of interest due to the link between these self-aggregating proteins and the progression of neurodegenerative disease. More recently, research has been directed at the exploitation of self-assembly properties of amyloid proteins for use as templates for nanowires and fibrillar networks. Insulin is an ideal protein for these purposes due to the ease of aggregation, as well as the large aspect ratio and high chemical stability of the produced fibrils. Insulin in pH 2 solution quickly forms aggregates in the presence of 65 °C heat. We have investigated the effect of oscillatory shear on the nucleation and growth of amyloid fibrillar networks using rheology and TEM to characterize the mechanical properties and structure of the network respectively. We contrast networks nucleated under oscillatory shear with networks nucleated in static and agitated conditions, and discuss network properties in the context of use in templating nanostructures. We find that the structural characteristics of the formed networks, including the density of fibrils, are affected by shear during the nucleation phase of amyloid growth.

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