

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Unfolding of Collapsed Polymers in Shear Flow Enhanced by Colloidal Suspensions: Effect of Colloid Banding Structures in Confining Channels HSIEH CHEN, ALFREDO ALEXANDER-KATZ, MIT — Very recently, using hydrodynamic simulations we have demonstrated that colloidal suspensions can greatly enhance the unfolding of collapsed single polymers in shear flow. Furthermore, we have shown that the enhancement may be suppressed if the colloid size is commensurate with the confining channel height, where the colloids form well-defined banding structures. In this study, we analyze the colloid banding structures in details and their relations to the polymer unfolding. We find that, for the colloid volume fractions up to 30%, the colloids form simple cubic (sc), hexagonal (hex), or the mixture of sc + hex structures depending on the commensurability of the colloid size and the channel height. By directly changing the height of the confining channels, we show that the collapsed polymers have the highest unfolding when the channel height is non-commensurate with either sc or hex structures.

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Date submitted: 08 Nov 2011

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