

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Photo-Regeneration of Severed Gel Using Photo-Controlled Radical Polymerization AWANEESH SINGH, Univ of Pittsburgh, OLGA KUKSENOK, Clemson University, JEREMIAH A. JOHNSON, Massachusetts Institute of Technology, ANNA C. BALAZS, Univ of Pittsburgh — Using the framework of dissipative particle dynamics (DPD) simulation, we developed a novel computational model that enables photo-regeneration of the gel matrix when a significant portion of the material is severed. We considered photo-controlled radical polymerization (photo-CRP) within polymer networks with embedded iniferters (initiators for the photo-CRP reaction). These iniferters turn on the polymerization process in the presence of light with monomers and cross-linkers in the solution. This "photo-growth" allow us to effectively regenerate severed gels under the application of light. The growth process can be turned off once the polymerization is near completion, which forms a new cross-linked gel that resembles the uncut material. The polymerization rate can be modulated by altering the light intensity.

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Date submitted: 05 Nov 2015

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