Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Shape Memory Polymers from Blends of Elastomers and Crystalline Small Molecules KEVIN CAVICCHI, NICOLE BROSTOWITZ, Dept of Polymer Engineering, University of Akron, BRENT HUKILL, Dept of Chemical Engineering, Rose Hulman Institute of Technology, HEATHER FAIRBAIRN, Dept of Chemical Engineering, University of Akron — This talk will present work on the fabrication of shape memory polymers (SMPs) by swelling natural with molten fatty acids. By this method a SMPs with excellent shape fixity and recovery can be obtained during free recovery after uniaxial deformation to 100% strain. Experiments to measure the shape memory properties under both stress and strain controlled conditions will be reported and compared. This fabrication method offers a number of advantages for preparing SMPs. First, it utilizes natural rubber as the base material for the SMP, which capitalizes on a high performance, commodity elastomer. Second, by blending a commercial polymer with a small molecule additive no additional chemistry is needed for the preparation of the SMP. Third, this route inverts the typically processing steps by crosslinking the permanent network prior to formation of the physically crosslinked reversible network. This offers a means to potentially generate a SMP from any preformed elastomeric article.

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Date submitted: 23 Nov 2014 Electronic form version 1.4