

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Rheological Properties of N-(isopropylacrylamide)-Clay based Nanocomposite gels DIVYA BHATNAGAR, Stony Brook University, JACK LOMBARDI, Estee Lauder, MIRIAM RAFAILOVICH, SUNY Stony Brook — Polymer -Clay nanocomposite gels (NC gels) consisting of N-(Isopropylacrylamide) (NIPA) and exfoliated inorganic clay (hectorite) were investigated in terms of their rheological properties. Depending on the clay concentration (Cclay), NC gels exhibit unique changes in their mechanical strength. To investigate their mechanical properties NC1-NC25 gels were subjected to oscillatory shear rheometry and Oscillatory stress, frequency and temperature sweep was conducted to evaluate the respective G's with varying shear stress, frequency and temperature. The results from stress sweep indicated the clear dependence of G' on Cclay. G' increased with an increase in clay content making NC25 the stiffest and NC1 the softest. Frequency sweep also suggested the formation of a stable polymer-clay platelet system. Results from temperature sweep suggested the stability of the polymer-clay network over a range of temperatures where a slight drop was seen in G' for gels NC1-NC8. From NC10-NC25, temperature had no effect on their respective G's. Glucose was added into the NC3 and NC5 polymer-clay system and Oscillatory stress and frequency sweep were conducted. The glycated NC3 gel collapsed when the glucose concentration was increased to 0.5-1%(w/v) although glycated NC5 did not register much noticeable results.

Divya Bhatnagar
Stony Brook University

Date submitted: 15 Dec 2009

Electronic form version 1.4