Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Controlling Mechanical Properties of Bis-leucine Oxalyl Amide Gels WILLIAM CHANG, DANIEL CARVAJAL, KENNETH SHULL, Northwestern University — is-leucine oxalyl amide is a low molecular weight gelator capable of gelling polar and organic solvents. A fundamental understanding of self-assembled systems can lead to new methods in drug delivery and the design of new soft material systems. An important feature of self-assembled systems are the intermolecular forces between solvent and gelator molecule; by changing the environment the gel is in, the mechanical properties also change. In this project two variables were considered: the degree of neutralization present for the gelator molecule from neutral to completely ionized, and the concentration of the gelator molecule, from 1 weight percent to 8 weight percent in 1-butanol. Mechanical properties were studied using displacement controlled indentation techniques and temperature sweep rheometry. It has been found that properties such as the storage modulus, gelation temperature and maximum stress allowed increase with bis-leucine oxalyl amide concentration. The results from this study establish a 3-d contour map between the gelator concentration, the gelator degree of ionization and mechanical properties such as storage modulus and maximum stress allowed. The intermolecular forces between the bis-leucine low molecular weight gelator and 1-butanol govern the mechanical properties of the gel system, and understanding these interactions will be key to rationally designed self-assembled systems.

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Date submitted: 29 Nov 2010 Electronic form version 1.4