Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Silicone Elastomer Networks with Tunable Modulus for Cell Mobility Studies JULIE N.L. ALBERT, KIRILL EFIMENKO, JAN GENZER, North Carolina State University — Silicone elastomer networks provide a versatile platform for studying the effects of compliance and surface chemistry on cell movement. One major advantage of these materials over more commonly used poly(acrylamide) surfaces or hydrogel networks is that they do not swell with water; therefore, the physical properties measured in the dry state are representative of those present under aqueous conditions. In this work, we tuned the moduli of poly(dimethylsiloxane) (PDMS) networks by manipulating the cross-link density *in-situ* during network formation. This regulation of cross-link density was accomplished by cross-linking at polymer chain ends with both difunctional and multi-functional cross-linking agents. The difunctional cross-linkers serve as chain extenders whereas the multifunctional cross-linkers facilitate formation of a chemically cross-linked network. Networks with moduli ranging from ≈10 kPa to ≈1 MPa were fabricated in this fashion by adjusting the polymer molecular weight, the ratio of difunctional to multifunctional cross-linker, and the ratio of total cross-linker to number of polymer chains. The same approach can be applied to fabricate poly(vinylmethylsiloxane) networks, which can be further tailored through side-chain cross-linking or surface functionalization of pendent vinyl groups.

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Date submitted: 16 Dec 2011 Electronic form version 1.4