

Abstract Submitted  
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**Mechanical and swelling properties of PDMS interpenetrating polymer networks** CLAUDE COHEN, SEONG HYUN YOO, Cornell University — Poly(dimethylsiloxane) (PDMS) interpenetrating networks (IPNs) of a large and a small molar mass PDMS were prepared. Six series of IPNs were obtained by first tetra-functionally end-linking long vinyl-terminated PDMS neat or in a 50 per cent solution with unreactive PDMS chains. These networks were then dried and swollen with short reactive telechelic PDMS that were subsequently end-linked. We found that the correlation between modulus ( $E$ ) and equilibrium swelling ( $Q$ ) in toluene of the PDMS IPNs obeys a scaling relation identical to that of normal unimodal PDMS networks. The results of the toughness of the networks represented by the energy required to rupture them were analyzed in terms of a recent model by Okumura (Europhysics Letters 67(3), 470, 2004). A modified version of this model that assumes each component of the double network to be subjected to an equal stress gives a good representation of the data.

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