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Mechanical and swelling properties of end-linked polydimethylsiloxane networks with hydrogen bonding or ionic interactions CLAUDE COHEN, ASHISH BATRA, Cornell University — We have synthesized a series of endlinked polydimethylsiloxane networks in which the polydimethylsiloxane chain has carboxyl groups at regular intervals along the polymer backbone. The spacing between these carboxyl groups and the number of these carboxyl groups/chain has been varied. Modulus studies at room temperature when carboxyl groups have very weak interactions show moduli similar to conventional endlinked PDMS networks. At high temperatures such as 150 C, carboxyl groups undergo intermolecular interactions and act as additional cross-link points thereby strengthening the networks. On bringing the networks back back to room temperature a number of these intermolecular bonds are retained. Swelling data on networks annealed at 150 C for several days as well as those not annealed will be presented. Carboxyl based networks have also been converted to Gallium and Cobalt networks by treatment with appropriate salts. Swelling and moduli studies at room temperature and on thermally annealed samples of these ionomer networks with both covalent endlinks and physical ionic domains will be presented.

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