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Shape-Memory Network Polymers Containing Reversible H-Bonding Associating Groups JIAHUI LI, MITCHELL ANTHAMATTEN, Department of Chemical Engineering, University of Rochester — Thermally reversible secondary interactions such as H-bonding can be used to stabilize mechanically strained states at low temperatures. A new type of lightly crosslinked shape-memory polymer is reported which contains reversible H-bonding ureidopyrimidinone (UPy) side-groups. Butyl acrylate, UPy containing monomer, and crosslinkable monomers were copolymerized and cast into films. Experiments on those elastomers using thermal-mechanical analysis showed clear shape-memory effects. The shape recovery ratio of those elastomers is nearly 100%, and the shape fixity ratio is typically 90%. Interestingly, the materials' shape recovery rate exhibits Arrhenius-like temperature dependence. Activation energies were obtained by fitting the TMA creep experiment data, and they were compared to the dynamics of UPy H-bonding dissociation.

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