Cover Picture

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The cover picture shows the thermally induced shape-memory effect for a covalently cross-linked polymer network. The polymer in its temporary shape (cube, picture on top) is heated from room temperature up to 70°C. Within 60 seconds the sample recovers its memorized, permanent shape of a nearly planar foil (picture on top left). The visual change of the material from opaque to transparent is caused by the melting of crystallites of the switching segments. The scheme in the center of the picture illustrates the molecular mechanism of the shape-memory effect. The shown polymer network, which is synthesized from poly(ε-caprolactone)dimethacrylate as macromonomer, is one of the first polymer systems that have specifically been developed for applications in the biomedical field. The net points (black) determine the permanent shape while the crystallites (blue) stabilize the temporary shape. More on the current state and the potential of this technology can be found in the review by A. Lendlein and S. Kelch on p. 2034 ff.