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**Isothermal Programming Triple Shape Memory**[1] SERGEI SHEIKO, JING ZHOU, QIAOXI LI, SARA TURNER, VALERIE ASHBY, University of North Carolina at Chapel Hill, ANDREY DOBRYNIN, University of Connecticut — While a variety of shape memory materials have been developed for triple shape memory (TSM), different fixation temperatures are required for memorizing different shapes, with imposed limitations on materials design. We present a new strategy for TSM, where different shapes are programmed at a constant fixation temperature and can be applied to a variety of semi-crystalline elastomers. This universal strategy is based on controlling the interplay between shape-memory thermodynamics and kinetics of polymer crystallization. We have developed a composite model to study correlations between the control parameters (chemical composition, crosslinking density, crystallization rate) and TSM performance (shape fixation and recovery). Furthermore, the isothermal TSM allows one-way reversible shape memory.

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