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Tuning the Second-Order Structural Transition in the Compound MnAs via Structural Anisotropy[1] B. D. WHITE, Central Washington University, K. HUANG, I. K. LUM, J. J. HAMLIN, S. JANG, University of California, San Diego, G. J. SMITH, Stony Brook University, J. W. SIMONSON, Farmingdale State College, C. S. NELSON, National Synchrotron Light Source, M. C. ARONSON, Stony Brook University and Brookhaven National Laboratory, M. B. MAPLE, University of California, San Diego — The second-order structural phase transition in MnAs is typically observed near $T_S = 400$ K; however, magnetization and specific heat measurements on MnAs single crystals that were grown in a molten Sn flux revealed a significantly lower transition temperature of $T_S \simeq 353$ K. The structural phase transition at T_S is thought to be governed by the dependence of a soft phonon mode on unit cell volume. Measurements of the thermal expansion on these single crystals uncovered several differences in the volumes temperature dependence when compared to other reports for MnAs. While such differences might be partially responsible for the anomalously low value of T_S, we also observed a suggestive correlation between the ratio of hexagonal lattice parameters, c/a, and T_S. This second observation suggests that the degree of structural anisotropy in MnAs could play an important and heretofore unappreciated role in tuning T_S.

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