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Magnetic phase transitions and magnetization reversal in MnRuP[1] P. LAMPEN-KELLEY, D. MANDRUS, University of Tennessee and Oak Ridge National Lab — The ternary phosphide MnRuP is an incommensurate antiferromagnetic metal crystallizing in the non-centrosymmetric Fe_2P-type crystal structure. Below the Neel transition at 250 K, MnRuP exhibits hysteretic anomalies in resistivity and magnetic susceptibility curves as the propagation vectors of the spiral spin structure change discontinuously across $T_1 = 180$ K and $T_2 = 100$ K. Temperature-dependent X-ray diffraction data indicate that the first-order spin reorientation occurs in the absence of a structural transition. A strong magnetization reversal (MR) effect is observed upon cooling the system through T_N in moderate dc magnetic fields. Positive magnetization is recovered on further cooling through T_1 and maintained in subsequent warming curves. The field dependence and training of the MR effect in MnRuP will be discussed in terms of the underlying magnetic structures and compared to anomalous MR observed in vanadate systems.

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