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The equivalency between hydrostatic pressure and Si doping in the giant magnetocaloric compound $Gd_5(Si_xGe_{1-x})_4$ studied by X-Ray Magnetic Circular Dichroism. Y.C. TSENG, Northwestern University, D. HASKEL, J. LANG, S. SINOGEIKIN, Argonne National Laboratory, YA. MUDRYK, V.K. PECHARSKY, Ames Laboratory, K. GSCHNEIDNER JR., Materials and Engineering Physics,Ames Laboratory, ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LABORATORY COLLABORATION, MATERIALS AND ENGINEERING PHYSICS, AMES LABORATORY COLLABORATION — The effect of pressure ($P \leq 150$ kbar) upon the magnetic properties of giant magnetocaloric material $Gd_5(Si_xGe_{1-x})_4$ (x=0.125, 0.5) was investigated by x-ray magnetic circular dichroism measurements in a diamond anvil cell. The ferromagnetic Curie temperature, Tc, increases linearly with pressure albeit with different slopes dTc/dP for x=0.125 and 0.5. This pressure dependence of Tc, together with a discontinuity in Tc (P) at $\sim$274K, are also observed in the x-T phase diagram. The equivalency of pressure and Si demonstrates that the magnetic properties in this class of materials are controlled by volume, and not by preferential substitution of Si/Ge at certain lattice sites.

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