Magnetocaloric Properties of Thin Film Heterostructures\textsuperscript{1} H. KIRBY, C. BAUER, University of South Florida, Department of Physics, B.J. KIRBY, J. LAU, NIST, C.W. MILLER, University of South Florida, Department of Physics — In an effort to understand the impact of nanostructuring on the magnetocaloric (MC) effect, we have studied gadolinium in MgO/W(50 Å)/[Gd(400 Å)/W(50 Å)]\textsuperscript{8} heterostructures [Miller et al., J. Appl. Phys. 107, 09A903 (2010)]. The entropy change peaks at a temperature of 284 K with a value of 3.4 J/kg K for a 0–30 kOe field change. Polarized neutron reflectometry was used to determine the depth profile of the magnetic moment per Gd atom, $m_{\text{Gd}}$, in a Gd/W multilayer. Our results suggest that creating materials with Gd-ferromagnet interfaces may increase the $m_{\text{Gd}}$, leading to enhanced MC properties. Therefore SiO\textsubscript{x}/Fe(50 Å)/Gd(300 Å)/Fe(50 Å) heterostructures have been investigated.

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