Title:	Magnetocaloric effects from an interplay of magnetic sublattices in Nd2NiMnO6
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Abstract:	We present a combined experimental and theoretical study to understand the magnetism and magnetocaloric behavior of the double perovskite Nd2NiMnO6. The magnetic susceptibility data confirms a ferromagnetic transition with K. An additional feature at T = 25 K, indicative of antiferromagnetic correlations, is present. A positive magnetocaloric effect (MCE) near and a negative MCE around T = 25 K is inferred from the temperature dependence of the change in magnetic entropy at low magnetic fields. The negative MCE peak is suppressed on the application of a magnetic field and can be made to switch to a conventional positive MCE upon increasing magnetic field. We understand and reproduce these features in Monte Carlo simulations of a phenomenological Heisenberg model for Nd2NiMnO6. The validity of the model is tested using density functional theory calculations. We argue that this simple understanding of the experimental observations in terms of two antiferromagnetically coupled sublattices allows these results to be useful across a broader class of magnetocaloric materials.
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