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Magnetic Compensation in Ferrimagnetic Bimetallic Oxalates[1]
PETER REIS, University of North Dakota and Oak Ridge National Laboratory, RANDY FISHMAN, FERNANDO REBOREDO, Oak Ridge National Laboratory, JUANA MORENO, Unviersity of North Dakota — Bimetallic oxalates are layered organic magnets with the chemical formula A[M(II)M'(III)$(ox)_3$], where M(II) and M'(III) are transition metal ions, A is an organic cation, and ox = C_2O_4 is the oxalate molecule. For some ferrimagnetic bimetallic oxalates, the magnetization changes sign at a compensation temperature below the ferrimagnetic transition temperature. We have initiated a systematic study of these compounds by examining the possibility of magnetic compensation for any possible combination of transition metal ions. Our model includes spin-orbit coupling for both M(II) and M(III) ions, the antiferromagnetic exchange between neighboring metal ions mediated by the oxalate bridges, and the effects of the ligand fields. Using mean-field theory, we predict candidates that may exhibit magnetic compensation for certain choices of the intercalated cation A.

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