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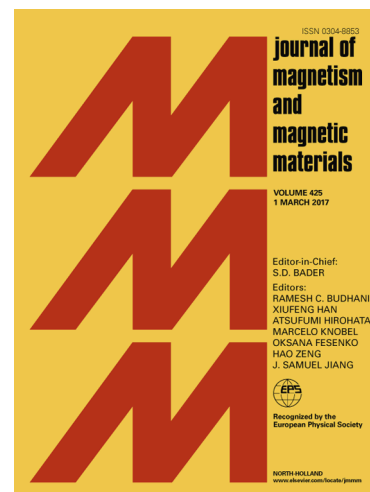
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Stone-Wales defected molecular-based $AFe^{II}Fe^{III}(C_2O_4)_3$ nanoribbons : thermal and magnetic properties

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Abstract

Thermal and magnetic properties of pristine and Stone-Wales (SW) defected zigzag mixed spin- $(2, 5/2)$ $AFe^{II}Fe^{III}(C_2O_4)_3$ nanoribbons have been investigated using Monte Carlo simulations. The variation in thermal and magnetic properties has been examined in terms of the number and the positions of SW-defects relative to the edges and the widths of ribbons, as well as to the temperature. Many interesting phenomena have been obtained, such as first and second order phase transitions, N -type compensation behavior and compensation temperature originating mainly from the antiferromagnetic exchange interaction between magnetic ions Fe^{III} and Fe^{II} . Furthermore, different hysteresis loop behaviors, such as a single and quintuple hysteresis loops which exhibit different number of steps and various shapes have been observed.

Keywords: Molecule-based magnets; Monte Carlo simulation; Ising model; Magnetic properties; Compensation behavior; Hysteresis loop; quintuple hysteresis; Néel classification nomenclature.

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