

Symmetry Induced Half-Metallic Alkaline Earth Ferromagnets

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Search for new half-metallic ferromagnetic binary compounds composed of alkaline earth and III or IV elements (like Boron or Carbon) is reported. *Ab initio* all-electron density functional theory calculations in the generalised gradient approximation indicate possibility of half-metallic ferromagnetism with Curie temperatures in the range of room temperature. These are a new type of theoretically predicted hypothetical materials without transition metal elements, not yet fabricated. Ferromagnetism is induced by the lack of four-fold crystalline symmetry for lattice constants larger than that of equilibrium for the bulk material. The predominant *s-p* electron mechanism is responsible for the formation of localised magnetic moments and their interactions.

9.7 cm

13.4 cm

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