

Magnetic properties and electronic structure of structurally disordered YCo_2 Pauli paramagnet

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The development of magnetic properties with increasing disorder in the exchange-enhanced Pauli paramagnet YCo_2 is discussed. The structural disorder is initially introduced by rapid quenching and further changes are caused by a high pressure torsion. Values of the magnetic moment determined for the plastically deformed ribbons reach $0.10 \mu_B/\text{Co}$ (deformation at $p = 4$ GPa) and $0.25 \mu_B/\text{Co}$ (6 GPa) at 2 K and arise not only from the surface of nanocrystals but also from their volume. *Ab initio* calculations confirm and explain the influence of different types of structural defects and chemical disorder on the electronic structure and magnetism of YCo_2 -based Laves phases. The calculated magnetic ground states are in qualitative agreement with experimental results for all considered structures with point defects.

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