
MA 1: Invited Talk Lyubina

Time: Monday 9:30–10:00

Location: H10

Invited Talk

MA 1.1 Mon 9:30 H10

Magnetovolume effects in L1₀ Fe-Pt alloys — •JULIA LYUBINA¹, INGO OPAHLE¹, MANUEL RICHTER¹, OLIVIER ISNARD², OLIVER GUTFLEISCH¹, KARL-HARTMUT MÜLLER¹, and LUDWIG SCHULTZ¹ —
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FePt alloys have recently attracted considerable attention as candidates for ultra-high-density magnetic storage media and as materials for special permanent magnet applications. The excellent magnetic properties of these alloys are associated with the ordered L1₀ FePt phase. Both experimental data and theoretical calculations indicate a

correlation between the degree of order within the L1₀ phase and fundamental properties, such as magnetocrystalline anisotropy and Curie temperature. In contrast, the saturation magnetisation of the L1₀ phase was reported to be largely independent of the degree of order at a fixed composition. In this work, we report on a combined neutron powder diffraction and density functional study of ordered and partially ordered Fe_{100-x}Pt_x ($x = 41-52$) alloys prepared by mechanical alloying at 77 K and subsequent heat treatment. For alloys with almost perfect L1₀-type long-range order the experimental value of the Fe magnetic moment was determined to be $2.8 \pm 0.1 \mu_B$. It is shown that the Fe moment drops with increasing Fe content, but is less sensitive to the degree of order.