

Abinitio Investigation on the Magnetic Phase Stability of the FePt Surface

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FePt₃ alloy is one of the most studied materials for the patterned media storage applications. Controlling the magnetic phase stability is the main issue for this material since it has a variety of magnetic phases that sensitively transform depending on the environment. In bulk, two antiferromagnetic (AFM) phases in ordered L1₂ cubic structure are stable at low temperature while a chemically disordered single crystal structure is found to stabilize in ferromagnetic (FM) phase with a high T_c well above room temperature and a large saturation magnetization. In this study, we report *ab-initio* density functional theory (DFT) calculations to predict that, in contrast to the bulk alloy, the ordered FePt₃ thin films on Pt(110) substrate can be stabilized in the FM phase over the AFM phases. Our results reveal that the FM phase is significantly stabilized by missing row surface reconstruction.