

Magnetism of FeRh(001) thin films with different thickness and surface-termination

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FeRh, which is one of the promising magnetocaloric effect (MCE) materials[1], shows G-type antiferromagnetic (G-AFM) ordering [2] in bulk. In this study, we report magnetic properties of FeRh (001) thin films with different thickness from 3-monolayers (ML) to 15-ML. Two type of surface of FeRh film are considered: (i) Fe-terminated and (ii) Rh-terminated. The Fe-terminated films show a G-AFM like bulk regardless of thickness. But, the Rh-terminated case exhibits ferromagnetic (FM) ordering for films thinner than 15-ML. We also report calculated magnetocrystalline anisotropies and Curie temperatures as functions of film thickness. From this study, we expect that more efficient MCE properties of FeRh can be obtained by tailoring its thickness and surface.

References

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