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Spin locking at the apex of nano-scale platinum tips

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Abstract

Nanostructures based on platinum, such as small clusters or STM-tips, often exhibit an atomistic structure that relies upon one or very few strongly under-coordinated platinum atoms. Here, we analyze a paradigmatic example, an apex atom on a pyramidal platinum cluster employing the density functional theory. We show that such a pristine platinum tip exhibits a spin polarization of the apex atom with a remarkable robustness. Due to a depletion of the projected density of states at the apex position, the apex-magnetization is efficiently locked to about $0.6\mu_B$.

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