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【835】 Magnetic properties and morphology of cobalt-cobalt oxide core-shell structured nanoparticles

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We report the formation and magnetic properties of metallic cobalt-core and oxide shell structured nanoparticles upon oxidation of Co nanoparticles with molecular oxygen under ultra-high vacuum conditions. The presence of a core-shell structure was confirmed with HR-STEM while x-ray photoemission electron microscopy shows that the core remained metallic and magnetic at low oxygen dosage, with CoO as the oxide shell. At higher oxygen dosages CoO and Co₃O₄ form the oxide shell and the core loses its magnetic contrast. These results show that the presence of high magnetic anisotropy in Co nanoparticles does not arise from a surface anisotropy contribution.

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