

湿法制备纳米晶Co₃O₄及其微观结构研究

王新喜,吕光烈,曾跃武,胡秀荣,陈林深

浙江大学中心试验室

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摘要 采用[Co(NH₃)₆]³⁺和Co²⁺在温度50~90 °C, pH=9~11条件下制备了纳米晶Co₃O₄.X射线衍射仪(XRD)、透射电镜(TEM)分析表明:产物为尖晶石型结构,空间群Fd3m,晶胞参数a=0.80777(5)nm,氧参数μ=0.3895(7),形貌为球形,晶粒尺寸约为4~30nm.研究了反应温度对其晶粒大小和分布、形貌、结晶度等微观结构的影响,并初步探讨了反应机理和生长机制.

关键词 [氧化钴](#) [纳米材料](#) [微观结构](#) [X射线衍射分析](#) [透射电子显微术](#) [晶体结构](#) [反应机理](#)

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Studies on the Nanocrystalline Co₃O₄ by Wet Synthesis and Its Microstructure

Wang Xinxi,Lu Guanglie,Zeng Yuewu,Hu Xiurong,Chen Linshen

Central Laboratory, Zhejiang University

Abstract The nanocrystalline Co₃O₄ was prepared at 50 ~ 90 °C and pH = 9 ~ 11 using [Co(NH₃)₆]³⁺ and Co²⁺ ions. X-ray diffraction (XRD) and transmission electron microscopy (TEM) analysis indicated that the product was spinel-type with the space group Fd3m. The lattice constant is 0.80777(5) nm, and the oxygen parameter p. = 0.3895(7). The shape of the crystallite is spheric and the size of that is about 4 ~ 30 nm. The effect of temperature on the microstructure of the crystallite, such as the crystallite size and the distribution, the shape and the crystallinity were investigated. The mechanism of the formation and the growth of the crystallite were also discussed.

Key words [COBALT OXIDE](#) [NANOPHASE MATERIALS](#) [MICRO-STRUCTURE](#) [XRD](#) [TEM](#) [CRYSTAL STRUCTURE](#) [REACTION MECHANISM](#)

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