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回流法制备纳米 NiZn铁氧体及成相机理研究

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摘要

采用回流法合成了纳米级的尖晶石相NiZn铁氧体. 通过XRD测试和回流液反应过程中pH值变化分析, 确定了最佳的回流反应时间为6h, 同时对回流反应的机理进行了初步的研究. 透射电镜结果显示NiZn铁氧体的颗粒为10~30nm, 高分辨透射电镜分析表明回流法合成的铁氧体为单一尖晶石相. 用VSM研究了纳米NiZn铁氧体粉料的软磁特性.

关键词 回流法 NiZn铁氧体 尖晶石相

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Nanocrystalline NiZn Ferrite Prepared by Refluxing Method and Mechanism of Spinel Formation

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Abstract

Nanocrystalline NiZn ferrite powders with spinel structure were prepared by a new chemical method---refluxing method. Refluxing time and the mechanism of NiZn ferrite spinel formation were discussed based on the XRD analysis and pH value measurement. The results show that the optimum refluxing time is 6h. The particle sizes of $Ni_{0.5}Zn_{0.5}Fe_2O_4$ nano-powders prepared by the refluxing method are about 10~20nm with TEM analysis, and the results of HRTEM AND SAED approve that $Ni_{0.5}Zn_{0.5}Fe_2O_4$ nano-powders prepared are with the single spinel phase. VSM results reveal that the prepared $Ni_{0.5}Zn_{0.5}Fe_2O_4$ powder has typical soft magnetic characteristics.

Key words refluxing method NiZn ferrite spinel

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