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ZnO及其掺杂纳米粒子的反相微乳液法合成及表征

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Microemulsion-mediated synthesis and characterization of zinc oxide and doped nanoparticles

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摘要 分别以OP/正庚烷/正己醇/水溶液和吐温60/溴代十六烷基吡啶/二甲苯/正戊醇/水溶液反相微乳液体系,合成了ZnO及ZnO-Cr₂O₃,ZnO-Cr₂O₃-NiO,ZnO-Cr₂O₃-NiO-MnO掺杂纳米粒子.研究了前驱物、反应物浓度和后处理对粒子制备和粒径的影响.结果表明:所给微乳液体系适合ZnO及其掺杂纳米粒子的制备;通过选择反应途径及控制反应物浓度可实现对粒径的控制;ZnO纳米粒子的粒径为10~200nm,二元、三元、四元掺杂型纳米粒子的粒径均约为20nm.

关键词: 纳米粒子 微乳液法 氧化锌 掺杂

Abstract: ZnO nanoparticle and ZnO-Cr₂O₃,ZnO-Cr₂O₃-NiO,ZnO-Cr₂O₃-NiO-MnO doped nanoparticles were synthesised.In the systems of OP/heptane/1-hexanol/H₂O reversed microemulsion,the effects of precursor,reactant concentrations and subsequent treatments on preparation and size of nanoparticles were studied.The results show that OP/heptane/1-hexanol/H₂O reversed microemulsion systems is suit for preparation of ZnO and its doted nanoparticles,and size of nanoparticles can be controlled by choose of precursor and different reactant concentrations.These ultrafine ZnO nanoparticals have size ranging from 10-200?nm and the doted ones have size of 20nm.

Key words: nanoparticles microemulsion-mediated sythesis zinc-oxide doted

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