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HF对微纳米ZnO的形貌及其润湿性的影响

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摘要: 利用氢氟酸(HF)的调控作用, 基于低温(95 °C)液相技术制备具有不同形貌和不同润湿性能的微纳米ZnO, 研究氢氟酸对其形貌及润湿性的影响。结果表明, 随着HF加入量的不断增加, ZnO的形貌从“短棒”、“球形”、“花形”到“线形”发生变化, 相应表面的水接触角越来越大; 当在40 mL反应溶液中加入400 μL 5%的HF时, ZnO的形貌变为具有纳米亚结构的“微球”形, 其表面开始显示出超疏水性。各种形貌ZnO表面在真空紫外光和暗室保存的循环作用下均具有疏水/超亲水快速可逆改变特性

关键字: ZnO; HF; 微观形貌; 润湿性; 液相技术

Effect of hydrofluoric acid on morphology and wettability of micro-nano ZnO powders

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Abstract: Several kinds of micro-nano ZnO powders with different morphologies and wettabilities were prepared by low-temperature solution method, based on the control of hydrofluoric acid (HF) additives. The results reveal that both the morphology and the wettability change with the quantity of HF adding in the reaction solution; when the quantity of HF increases, the morphology of ZnO changes from “rod”, “sphere” and “flower” to “wire”, and the corresponding water contact angle increases. When 5% HF of 400 μL is added into the 40 mL reaction solution, the morphology of ZnO demonstrates a microsphere with sub-nanostructures, whose surface shows superhydrophobic properties. In addition, all the wettabilities of the ZnO powders with different structures can be reversibly switched circularly by alternation of VUV irradiation, dark storage

Key words: ZnO; HF; morphology; wettability; solution method; hydrofluoric acid

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