

Synthesis and properties of flower-shaped copper oxide nanostructures grown by solution process

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Flower-shaped CuO nanostructures have been prepared by the simple solution process at 100 °C, by using copper nitrate, NaOH and hexamethylenetetramine (HMTA) without the use of any complex apparatus and reagents. The morphological investigations by FESEM revealed that the flower-shaped nanostructures are monodispersed and synthesized in very high density. The detailed structural characterizations exhibited the nanocrystalline nature with monoclinic structure for the as-synthesized flower-shaped CuO nanostructures. We researched that the obtained flower shaped morphology is strongly dependent on several parameters in which the concentration of HMTA, presence or absence of NaOH and HMTA and reaction time are the most influential factors which affect the morphology of the flower-like structures. Therefore, extensive experiments depending on the HMTA concentrations, presence or absence of NaOH and HMTA and time were performed to conclude some possible growth mechanism for the formation of the as-grown products. Finally, a plausible growth mechanism has also been discussed.