

Morphology Controlled Synthesis of CuO using Microwave Irradiation

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The microwave irradiation was used to synthesize the different morphologies of CuO crystals, such as the leaf-like, dandelion-like and hollow structure. Various CuO nano-, microstructure synthesis was achieved at a low temperature (95 °C) with low power microwave-assisted heating (about 50 W). The different morphologies of CuO crystals were obtained with the different species of alkali, which supply hydroxide ions or ammonia molecules. The XRD patterns of as-prepared CuO crystals indicated the high crystal quality of CuO with the monoclinic crystal structure. The FE-SEM and TEM images of CuO crystals showed the leaf-like CuO crystals with an average size of 950 nm in length and 450 nm in width, the CuO crystals with an average size of 450 nm in length and 200 nm in width, the dandelion-like CuO structures with an average diameter 2 μm and the hollow structures of CuO with an average diameter 2 μm. Possible structure formation mechanisms for shape-selective CuO synthesis were proposed based on results.