

Growth and Properties of NiO and β -Ni(OH)₂ nanostructures prepared by solution process

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We present a very simple and effective aqueous solution route to synthesize the good quality in large quantity nickel hydroxide nanostructures, i.e. flower-shaped structures composed of thin nanosheets of nickel oxide. The flower-shaped structures were synthesized simply by using nickel chloride and ammonium hydroxide at 65 °C in 4 hrs. The general morphological observations revealed that the flower-shaped structures are composed of several Ni(OH)₂ thin nanosheets. Each nanosheet of this flower-shaped structure is about 2–3 μm wide and 40–60 nm in thickness. All the nanosheets are joined to each in such a manner that the flowers exhibit spherical shaped morphologies. Typically the full array of a single flower-shaped structure is about 3–5 μm while the width ranges between 5 and 6 μm. Moreover, the detailed structural and optical observations by XRD, FTIR, UV-Vis, high-resolution TEM and TGA revealed the good quality for the as-grown flower-shaped Ni(OH)₂ structures. Finally, a plausible growth mechanism has also been proposed.