

Selective Synthesis of Copper Microsheets and Ultralong Microwires via a Surfactant Assisted Hydrothermal Process I

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Abstract

The surfactant assisted hydrothermal process for selective preparation of copper nanosheets and ultralong microwires by reducing Cu^{2+} with 2-(bis-phosphonomethylamino)propionic acid (dpc) under the action of cetyltrimethylammonium bromide (CTAB) or polyvinyl pyrrolidone (PVP) is presented. X-ray powder diffraction (XRD) and energy dispersive X-ray analysis (EDX) indicate that the products are pure Cu of cubic phase. The effects of starting material concentration and reaction time on morphology of nanosheets have been studied by scanning electron microscopy (SEM). The presence of CTAB and PVP as capping agents is identified by EDX, transmission electron microscopy (TEM) and FT-IR. The possible growth process for ultralong microwires was studied by stopping the growth at a series of intermediate morphology stages based on SEM observations. Optical properties of Cu nanosheets and ultralong microwires were studied by UV–Vis spectrophotometry.

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