Effect of pH on the synthesis of Cuo nanosheets by quick precipitation method

Abstract

In this paper, copper oxide nanosheets were successfully fabricated in polyvinylpyrrolidone (PVP) via a quick precipitation method. The synthesized CuO nanostructures were characterized by X-ray diffraction (XRD), UV-vis spectroscopy, transmission electron microscopy (TEM), field emission scanning electron microscopy, energy dispersive analysis of X-ray, and Fourier transform infrared (FT-IR) spectroscopy. The effect of pH on the final product was investigated. The results show that a higher volume ratio of NaOH results in well-defined CuO nanosheets. XRD results confirmed the formation of pure CuO with a monoclinic structure at higher pH, whereas gerhardtite was formed at lower pH. TEM results indicate that sheet-like CuO were formed at higher pH. FT-IR results show that C=O in PVP coordinated with CuO and formed a protection layer. The generation of CuO nanostructures was proven by UV-vis spectroscopy. The mechanism of the reaction was also discussed.

Keyword: Cuo; Nanorods; Nanosheets; Orientated attachment mechanism (OA); Polyvinylpyrrolidone; Quick precipitation.