Journal of Alloys and Compounds 491 (2010) 742–746

Contents lists available at ScienceDirect

Journal of Alloys and Compounds

journal homepage: www.elsevier.com/locate/jallcom

The influence of temperature on the structure of Cd-doped ZnO nanopowders

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ARTICLE INFO

Article history:
Received 12 October 2009
Received in revised form 3 November 2009
Accepted 5 November 2009
Available online 14 November 2009

Keywords:
Nanomaterials
Crystal growth
Dynamic growth index

ABSTRACT

A new and facile method has been used for preparation of CdZnO nanopowder. The prepared nanopowder was in the form of binary mixture of CdO and ZnO until annealing temperature 400 °C. When the annealing temperature increased above 400 °C the structure of the nanopowder was changed from binary mixture to a single hexagonal phase. Thermogravimetry/differential thermal analysis (TG–DTA), X-ray diffraction (XRD) and transmission electron microscopy (TEM) were used to follow the change in the microstructure and morphology of the prepared nanopowders at different temperatures. The effect of calcination temperature on the growth dynamics of CdZnO nanopowder showed that the dynamic growth index was 1.13 below 400 °C and 0.5 above it. This indicates that the rate of the grain growth was very fast especially at calcination temperature range 400–750 °C.