Morphological evolution of ZnO nanowires using various substrates

J. P. Kar, S.N.DAS, J. H. Choi, J.M. Myoung†
연세대학교
(jmmyoung@yonsei.ac.kr†)

In recent years, ZnO nanostructures have drawn considerable attentions for the development of futuristic electronic devices due to their superior structural and optical properties. As the growth of ZnO nanowires by MOCVD is a bottom-up technique, the nature of substrates has a vital role for the dimension and alignment of the nanowires. However, in the pursuit of next generation ZnO based nanodevices, it would be highly preferred if well-ordered ZnO nanowires could be obtained on various substrates like sapphire, silicon, glass etc. Vertically aligned nanowires were grown on A and C-plane sapphire substrates, whereas nanopencils were obtained on R-plane sapphire substrates. In addition, C-axis oriented vertical nanowires were also found using an interfacial layer (aluminum nitride film) on silicon substrates. On the other hand, long nanowires were found on Ga-doped ZnO film on glass substrates. Structural and optical properties of the ZnO nanowires on various substrates were also investigated.

Keywords: ZnO, Nanowires, MOCVD, Morphology

A comparative study of grinding mill type on aluminium powders with carbon nano tube: traditional ball mill and planetary ball mill

최희규†, 최경필, 배대형, 이승택, 이웅, 김성수†
창원대학교 나노신소재공학부; *경상대학교 BK21전환경생열에너지기계연구사업팀
(hkchoi99@changwon.ac.kr†)

Grinding characteristics for aluminium and carbon nanotubes (CNTs) powder during traditional and planetary ball milling investigated from the viewpoint of particle behaviour with the aim of developing CNT-dispersed samples ground based on powder metallurgy routes. In this work, a comparison between the pure aluminium and CNT input aluminium grinding was carried out to determine grinding time effect on size reduction. We observed that the use of the curly small-diameter multi-walled carbon nanotubes (MWCNTs) attributed to the beneficial role of the MWCNTs as grinding aids. It is suggested that careful choices of the sizes of CNTs and Al powders would allow fine-grinding of composite particles with uniformly distributed CNT reinforcements thereby ensuring improved properties of the final composites produced by low-temperature compacting.

Keywords: aluminium, CNT, Planetary ball mill, grinding, mechanical alloying