



Presents

Phosphorous-doped p-type ZnO

by Mr. Hu Guangxia

Date: 29 April 2009, Wednesday
Time: 10.00am to 11.00am
Venue: EA-02-15 (Executive Room)

Abstract

Recently, ZnO has attracted much more attention due to its potential applications in light emitting diodes. Comparing with n-type ZnO, p-type ZnO is difficult to produce. The aim of this study was to achieve p-type P:ZnO (phosphorous-doped ZnO) via co-sputtering ZnO and Zn₃P₂, to understand the roles of P and defects in ZnO. A mechanism of competition between donors and P-related acceptors was proposed and discussed. Firstly, the successful fabrication of p-type P:ZnO by controlling the doping concentration of P was demonstrated and discussed. With increasing P concentration, ZnO was changed from n-type to p-type. Also, a red-shift of the band gap energy and a lattice expansion were observed, which were believed to be due to the substitution of O by P. Secondly, the successful fabrication of p-type P:ZnO by controlling the oxygen partial pressure during deposition was demonstrated and discussed. With increasing oxygen partial pressure during deposition, conductive types of ZnO could also be controlled. ZnO homojunctions with a turn-on voltage of ~3.4 V were also fabricated to further verify the formation of p-type P:ZnO.

Speaker Mr. Hu Guangxia

Mr. Hu Guangxia obtained his B.S. from Northwest Institute of Light Industry in 1996, and M. E. from Shanghai Institute of Microsystem & Information Technology, Chinese Academy of Sciences in 2002. In 2004, he became a Ph. D. candidate in the Department of Material Science, NUS. Now he is a research fellow in Department of Materials Science & Engineering, NUS.

ALL ARE WELCOME!

Prof Li Yi Host