

Study of Electrical Defects in $\text{Zn}_{0.95}(\text{Mn,Co})_{0.05}\text{O}$ Grown by Pulsed Laser Deposition

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Diluted magnetic semiconductors are important materials for semiconductor spintronics applications. ZnO and GaN are typical materials such wide-bandgap semiconductors. Especially, the ZnO has much interesting for a based material for the diluted magnetic semiconductor, because of its theoretical high Curie temperature. ZnO has much interesting for a based material for the diluted magnetic semiconductor, because of its theoretical high Curie temperature. The pulsed laser deposition (PLD) system has an advantage to control the composition ratio of the grown film from the mixture target. We deposited ZnO with magnetic impurity by PLD technique. A cobalt and a manganese was used as the magnetic impurity and the atomic ratio was 5 %. ZnO with Co or Mn films were grown by PLD on sapphire substrates with ZnO buffer layer at some varied temperature between from 200 °C to 500 °C. The defects in the films were investigated by using deep level transient spectroscopy (DLTS) and photo luminescence measurements. For the DLTS measurement, Ti/Au was deposited over the large area of the sample to form an Ohmic contact. On the prepared sample the DLTS measurements were performed at temperature range from 20 K to 350 K.