P-039

GROWTH OF SiC FILMS ON SOI SUBSTRATES, B.-T. LEE, C.-K. MOON, D.-K. KIM, and J.-K. KIM (Chonnam National University, Kwangju, 500-757, Korea)

Heavy lattice strain and high density of structural defects are the main obstacles for the growth of high quality SiC films on Si substrates. Efforts have been reported, to use SOI wafers as the compliant substrate for the growth and thereby reduce the strain and defects. In this work, SiC thin films were grown at various conditions on SIMOX wafers with varying top Si thickness, and characterized using TEM, PL, Raman Spectroscopy, and XRD.

Results showed that a growth temperature lower than about 1200℃ is required to prevent the deterioration of the SOI structure and to reduce the etching of the top Si layer by the carrier gas during the initial heating stage. TEM images and Raman spectra of the SiC layers did not show any noticeable difference when grown on SOI with top layer thicker than 80nm, while signs of strain relief were observed when thinner top layers were used. Results of detailed analysis will be discussed during the presentation.

P-040

FABRICATION OF 4H-SIC SCHOTTKY BARRIER DIODES WITH HIGH BREAKDOWN VOLTAGES S.C.KANG, B.H.KUM, AND M. W. SHIN(Dept. of Inorganic Materials Eng., Myongji Univ., 38-2, Yongin, Kyunggi, 449-728, Korea), and **C. D. PARK**(Dept. of Electronic Eng., Myongji Univ., 38-2, Yongin, Kyunggi, 449-728, Korea)

The excellent electronic properties of SiC with its superior thermal conductivity make the material one of the prime candidate for the power electronic application of the next generation. This paper discusses about the processing and characterization of the high breakdown voltage 4H-SiC Schottky Barrier Diodes. The devices were fabricated using the heavily doped 4H-SiC wafer with an epilayer of 10 μm thickness and a doping(n) concentration of 1.2 x 10^{16}/cm^3. Ni was evaporated on the backside of the wafer to form blanket ohmic contact followed by an annealing in Ar atmosphere at 1000 ℃ for 30 min. The devices were passivated either by nitride or oxide and some were left in the bare surface for the purpose of comparison with the passivated. The schottky metal was evaporated and the schottky contact with a diameter of 300 μm was defined by lift-off process. The fabricated devices revealed the breakdown voltages in the range 120 V to 300 V, which is quite higher compared to the devices fabricated from Si or GaAs. However, this value is lower than the theoretically projected value.The reverse leakage current of the devices was quite low which is less than 10^{-7} Amp at the reverse bias voltage of 220 V. This paper will discuss in detail about noble device design rules for high breakdown voltages in the SBDs.

P-041

THE EFFECT OF CH_4:N_2 GAS PRESSURE ON a-C:H(N) FILM GROWN BY DC SADDLE FIELD PECVD, S. W. WHANGBO, H. K. JANG, G. KIM, C. N. WHANG (Atomic-scale Surface Science Research Center and Dept. of Physics, Yonsei Univ., Seoul 120-749, Korea), Y. - Z. YOO, H - G KIM(Dept. of material science and engineering, Kwangju Institute of Science & Technology, Kwangju, 572)

Hydrogenated amorphous carbon nitride [a-C::H(N)] films were deposited on p-type Si(100) by DC saddle-field PECVD to investigate the effect of CH_4:N_2 gas pressure on optical properties and structural changes.

The information of optical properties was investigated by photoluminescence and transmittance Chemical bonding of the films has been explored from FT-IR and XPS.

In this paper, the properties such as growth rate, chemical bonding, microstructure, and optical properties will be discuss as a function of nitrogen pressure.

P-042

PREPARATION AND CHARACTERIZATION OF CUIN3SE5 THIN FILMS PRODUCED BY SPUTTER DEPOSITION , C. H. CHUNG, S. D. KIM, H. J. KIM (School of Mat. Sci. and Eng., Seoul National Univ., Seoul, 151-742, Korea), J. S. SONG, K. H. YOON (Korea Institute of Energy Research, Taejon, 305-343, Korea)

Recently, it is reported that an In-rich layer existed on the surface of the absorber layer($CuInSe_2$) in high efficiency solar cell and it was identified as an ordered vacancy compound(OVC), $CuIn_3Se_5$. The existence of an OVC layer indicates that buried p-n junction is formed between P-$CuInSe_2$ and N-$CuIn_3Se_5$. Therefore OVC layer is expected to play an important role in high efficiency solar cell.

In this study, $CuIn_3Se_5$ was produced by selenization of sputtered Cu-In alloy within a partially closed graphite container under a low vacuum. High Se vapour pressure could be created by container system and enough Se diffusion into Cu-In alloy could be associated with high Se vapour pressure. XRD, EDX and Raman spectroscopy analysis were used to confirm OVC phase. Electrical and optical properties were also investigated .

POSTER SESSION