P-043

CHARACTERISTICS OF $CuInSe_2$ THIN FILMS BY SELENIZATION METHOD, S. D. KIM and H. J. KIM (School of Mat. Sci. and Eng., Seoul National Univ., Seoul, 151-742, Korea), F. O. ADURODIJA, J. S. SONG and K. H. YOON (Korea Institute of Energy Research, Taejon, 305-343, Korea)

The $CuInSe_2$ and related compounds(Ga, S) have been spotlighted as low cost, large area, and high efficient absorber layers of photovoltaic materials. The $CuInSe_2$ thin films were prepared by 2-step method. First, Cu-In precursors were deposited by co-sputtering at ambient temperature, and the composition of Cu-In was controlled by changing the Cu-In power ratio. And then Cu-In metal layers were selenized in two atmosphere; one was in Ar atmosphere at ATP, and the other was in vacuum. The $CuInSe_2$ thin films were analysed by SEM, XRD, EDS, Raman spectroscopy, AES, and Photoluminescence. Since the reaction in vacuum was simpler, the $CuInSe_2$ thin films deposited in vacuum had more uniform morphology and less kinds of defects than deposited at ATP.

P-044

SUBSTRATE DEPENDENCE OF PHOTOLUMINESCENCE FROM THE ZnS EPILAYERS GROWN BY HOT-WALL EPITAXY (HWE), SUNGUN NAM, JONGKWANG RHEE, YOUNG-MOON YU, BYUNGSUNG O, KI-SEON LEE (Dept. of Physics, Chungnam National Univ., Taejon 305-764, Korea), Y. D. CHOI and H. J. YUN(Dept. of Physics, MOKWON Univ., Taejon 301-729, Korea)

ZnS single-crystal thin films are grown on GaAs(100) and GaP(100) by HWE, and their photoluminescences (PL) are investigated and analyzed for comparison. The exciton peaks near the band edge are very strong and sharp, and other deep-level peaks are barely observable regardless of the substrates. The difference in the thermal expansion coefficient of ZnS and GaP is larger than that of ZnS and GaAs. So the energy positions of PL peak near the band edge of ZnS/GaP are shifted to the lower energy. For ZnS/GaAs and ZnS/GaP layers, the positions and the full width at half maximums (FWHM) of the $(A^o,X)_1$ PL peak as a function of epilayer thickness and the substrate temperature, respectively, are compared. PL is measured at 10 ~ 300 K. The free exciton (FE) are observed up to room temperature, and the temperature dependence is described by the Varshni equation. The FWHM values of FE for ZnS/GaAs and ZnS/GaP layers are 26 meV and 40 meV, respectively. The strain effects due to the lattice mismatch and the thermal expansion difference are investigated.

P-045

PHOTOCONDUCTIVITY CHARACTERIZATION OF MBE GROWN CdTe:In EPITAXIAL LAYER J. H. LEEM, SH. U. YULDASHEV, I. L. BOLOTIN, Y. S. RYU, H. Y. LEE, Y. B. HOU, H. C. JEON, J. K. HYUN, C. K. KANG, N. H. KIM T. W. KANG (Dept. of Physics, Dongguk Univ., Seoul, 100-715, Korea)

Using the photoconductivity technique, the decay rate of non equilibrium carriers of CdTe:In epitaxial films grown by MBE was investigated.

Photoconductivity decay curve of CdTe:In contained the slow component with few millisecond time constant. These results was explained by existence of deep traps for the minority carriers. But after hydrogenation the excess carrier lifetime is remarkably reduced. So the defect is passivated by hydrogenation. The activation energy of the deep traps is (E_V + 0.35) eV and (E_V + 0.43) eV determined by temperature dependence of excess carrier lifetimes.

P-046

SEM-CATHODOLUMINESCENCE OF DEFECTS IN CVD DIAMOND FILMS, DO. G. Kim and T. Y. SEONG (Dept. of MSE, K-JIST, Kwangju 506-712, Korea), Y. J. BAIK (Centre for Thin Films Tech., KIST, Seoul, 136-791, Korea), M. A. STEVENS KALCEFF and M. R. PHILLIPS (Microstructural Analysis Unit, Faculty of Sci., Univ. of Tech., Sydney NSW 2007, Australia)

Diamond films were grown on differently AC bias-enhanced nucleated Si (100) wafers by microwave plasma chemical vapour deposition. CL spectroscopy and imaging in a scanning electron microscope have been employed to investigate optically active defects and impurities in the diamond films. The CL results show that the diamond films contain isolated neutral vacancies, nitrogen, and defects such as twins and dislocations. Luminescence intensities of the associated peaks are found to depend on the alignments and the growth sectors of the diamond films. Comparison of the monochromatic CL and SEM images shows that the nitrogen impurities are homogeneously distributed across diamond grains with {100} growth facets. However, the defect-related centre such as dislocations was found to be located mainly near grain boundaries and {111} growth sectors.

POSTER SESSION