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THE IMPROVEMENT OF CL BRIGHTNESS AND DECAY TIME OF $CaTiO_3$:Pr PHOSPHOR,

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In order to enhance CL brightness of $CaTiO_3$:Pr phosphor which has been regarded as a phosphor having poor CL brightness in spite of high color purity and good conductivity, CL brightness and decay time were studied varying the sintering temperature and the atmosphere. As a sintering temperature was increased from 1100 to 1400 °C, CL brightness was improved about four times and decay time was reduced from 0.29 to 0.21 msec. And all samples prepared in Ar showed high CL brightness and short decay time in comparison with those sintered in air. In PLE spectra, the relative intensity of the peak at 395 nm of samples prepared in Ar was lower than that prepared in air. Then, the improvement of CL brightness of $CaTiO_3$:Pr phosphor seems to be due to the decrease of a defect density in $CaTiO_3$:Pr and the relative intensity of the peak at 395 nm in PLE spectra.

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FABRICATION AND CHARACTERIZATION OF NITROGENATED AMORPHOUS CARBON FOR FIELD EMITTER,

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The use of amorphous carbon(a-C) films for field emission in display applications was proposed several years ago. It has been known that nitrogen addition to a-C can cause the reduction of the electrical resistivity and optical bandgap, thus resulting in desirable properties as a electronic material. In this study, the a-C films with various nitrogen contents are prepared and tested as a field emitter. The modification of the chemical bonding states and electrical properties induced by nitrogen addition is examined in detail. The films are analyzed by the methods such as Raman, FT-IR, and XPS. Field emission tests are performed with a diode structure in a UHV chamber. Based on these analyses, the origin of the enhanced field emission from nitrogenated a-C is suggested.

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The Structural Information of Diamond-like Carbon Films by Spectroscopic Analyses,

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In recent years, there has been a growing attraction in the structure and properties of diamond-like carbon(DLC) films. In this study, the structures of diamond and graphite were compared to that of DLC films which were prepared using pulsed laser deposition(PLD). The deposition process is performed with a laser energy density from 8 to 20 J/cm^2 at room temperature without any auxiliary energy source incorporation. In order to investigate the bonding and electronic structure and chemical state of the film, Raman spectroscopy and X-ray photoelectron spectroscopy(XPS) were used. High resolution spectra were obtained for the XPS valence-band, X-ray-excited Auger electron(XAES), and photoelectron energy loss. The objective of this study is to develop improved procedures for characterizing the structure of DLC films. The Raman spectroscopy and C_{KLL} XAES fine structure provides an information of the carbon bonding state and the C 1s and valence-band spectra provide additional informations of the film structure.

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Fabrication of Silicon Field Emitter Arrays Using Low Temperature Processes,

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Field emitter arrays (FEAs) are extensively studied for electron sources in vacuum microelectronic devices and field emission display. Silicon is a promising material for the field emitters because of its compatibility with the semiconductor manufacturing technologies and its possibility of FEA integration with peripheral drive circuits. For the fabrication of a Field Emission Display (FED) on glass plates, the low temperature (<550℃) processes are necessary. So this work was aimed to the development of low temperature process for the formation of FED tips.

Very sharp tips was obtained by the isotropic etching method instead of the high-temperature (>800℃) sharpening oxidation. It was found that during the dry etching process, the residue layer was formed and this layer prohibited the formation of poly-Si tips. The methods to remove the residue layer were developed and the process of its removal was analysed with scanning Auger microscopy and scanning electron microscopy. The emission characteristics of the dry etched emitter arrays was also compared with those using the sharpening oxidation.