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SURFACE ACTIVATED BONDING OF PLASTICS AND COPPER AT ROOM TEMPERATURE, YUTAKA GO, NAOE HOSODA, and TADATOMO SUGA (Research Center for Advanced Scienceand Technology, The University of Tokyo, 6-1, Komaba 4-chome, Meguro-ku, Tokyo 153)

One of the most important problems in micro-electronic mounting technology is the bonding of polyimide and copper. In this paper, we applied this bonding to "Surface Activated Bonding at Room Temperature(SAB)" and studied the possibility of bonding. Any surface is activated by an irradiation of Fast Atom Beam (FAB) in ultra-high vacuum atmosphere. SAB is the method that bonding is realized by the activated surfaces for the mutual interaction of atoms. We studied the changes in the polyimide surface by Ar FAB irradiation by XPS to estimate the best conditions for SAB. Polyimide-Cu bonding was realized on the condition that polyimide was irradiated by Ar FAB in the doze quantities of 4.3×10^{15}-7.8×10^{16}counts/cm^2, and Cu was irradiated by Ar FAB in the doze quantities of 2.6×10^{17}counts/cm^2. At the interface of polyimide and Cu, the bonding was realized by Cu-O bonding of Cu and O^- generated at the polyimide surface during Ar irradiation.

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FORMATION OF HIGHLY ORIENTED J-AGGREGATES BY MIXING SYSTEM IN LB FILMS OF MERDCYANINE DYES

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The physical properties of LB film with merocyanine dye have been published and attract attention due to the important form both the optical-physical behavior and the anisotropy of molecules in experimental and theoretical view point. Specially, in the case of mixed LB film of dyes, mixing systems are most important and characteristics of LB film may be changed by that. Thus, the LB films of a merocyanine dye has been studied by optical absorption spectra measurements.

In the result measured by optical absorption spectra, merocyanine dye [6Me-DS], [DS] and [DSe] show the characteristics of red-shifted around 600nm, J-*like*(or-aggregate)band and [DO] single-peaked monomer band around 500nm. In the $[DX]_{1-x}[DO]_x$ LB film was observed that absorption peak different as to the mixed ratio of concentration. We pay attentation to the fact that the present system is a mixed component system. If, We focus on a dye molecule at the other component, its structure may be determined by the molecular interactions between not only the J-band or -aggregate but also monomer band structure. Thus study of merocyanine dye LB film using optical absorption spectra would be an insteresting problem of absorption peak shift and mixed component.

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VISIBLE PHOTOLUMINESCENCES FROM SILICON NANOCRYSTALS IN ION BEAM MIXED Si/SiO2 MULTILAYERS, J. H. Son, G. S. Chang, K. H. Chae, C. N. Whang(ASSRC and Dept. of Physics, Yonsei Univ., Seoul 120-749, Korea), J. H. Song, (Advanced Analysis Center, KIST, Seoul 130-650, Korea), and S. Im(Dept. of Metallurgical Engineering, Yonsei Univ., Seoul 120-749, Korea)

Si nanocrystals embedded in SiO_2 layer were fabricated by 80 keV Ar^+ ion beam mixing of Si/SiO_2 multilayers with the dose of 1.5×10^{16} ions/cm^2 at room temperature, followed by high temperature annealing at N_2 atmosphere. Glancing-angle x-ray diffraction(GXRD) shows the formation of nanocrystals in SiO_2 matrices. The photoluminescence excited by an Ar-laser(457.9 nm) shows an intense broad luminescent band with a peak near 700 nm at room temperature. This red-light emission is attributed to the luminescence from silicon nanocrystals produced by silicon precipitation.

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HETEROEPITAXIAL GROWTH OF HIGH QUALITY Y_2O_3 FILM ON AMORPHOUS SiO_2 LAYER, M. H. CHO, S. W. WHANGBO, J. G. SEO, S. K. KIM, S. Y. KIM, N. Y. KIM, AND C. N. WHANG (ASSRC & Dept. of Physics, Yonsei Univ., Seoul 120-749, Korea), S. C. CHOI (Thin Film Technology Research Center. KIST), S. J. CHO (Dept. of Physics. Kyungseong Univ., Pusan 608-736, Korea)

Y_2O_3 layer has been epitaxially grown on chemically oxidized Si substrates by ionized cluster beam deposition (ICBD). Characterization using X-ray diffraction (XRD), reflection high-energy diffraction (RHEED) show that film are oriented with the Y_2O_3[111] direction parallel to the substrate [111]. X-ray rocking curve indicate a high degree of crystalline perfection with FWHM of $\Delta\theta=0.06^\circ$. To achieve high quality epitaxy, it is essential to grow the silicon oxide on the substrate prior to film growth. It is closely related to the initial growth process including the reaction between yttrium metal and SiO_2 This silicon oxide is grown at 80℃ using wet chemical oxidation process.

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