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STUDY OF ELECTRONIC STRUCTURES OF Co-Pt ALLOYS, Y. D. CHUNG, K. Y. LIM, Y. S. LEE, C. N. WHANG(Atomic-scale Surface Science Research Center and Dept. of Physics, Yonsei Univ., Seoul 120-749, Korea), Y. JEON, B. S. CHOI(Dept. of Physics. Jeonju Univ., Jeonju 560-759, Korea)

In this study, we studied the electronic structure change in the Co-Pt alloys ion-beam-mixed and arc-melted using x-ray photoelectron spectroscopy(XPS), Auger energy shift and x-ray absorption near edge spectroscopy(XANES). These analysis tools provide us information about the charge transfer in the intermetallic bonding. Upon alloying, the XPS core-level peak shifts are different from the x-ray induced Auger peak shifts : core-level peak shifts of Pt 4f are larger than that of Co 2p but Auger shifts of Pt MNN are smaller than that of Co LMM. In XANES results, it is shown that Co p unoccupied states increases and Pt d empty states are filled upon alloying.

XANES experiments were accomplished at PLS.

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ELECTRONIC AND MAGNETIC PROPERTIES OF Fe MONOLAYER ON Mo(110)*, T.H. RHO, YOUNGSOO KWON, CHAEKANG LEE, G.B. CHA, and Soon C. HONG (Dept. of Physics, University of Ulsan, Ulsan 680-749, Republic of Korea), J.I. Lee (Dept. of Physics, Inha University, Inchon 402-751, Republic of Korea)

Electronic structure and magnetism of Fe monolayer on Mo(110)[1Fe/Mo(110)] are investigated by means of the all-electron local spin density full potential linearized augmented plane wave(FLAPW) method with a single slab approach. The average value of bulk interlayer spacings of the Fe and Mo is used as the Fe-Mo interlayer spacing, i.e. no relaxation allowed. We found magnetic moment of the Fe to be 2.21 μ_B which is almost the same as the calculated value(2.22 μ_B)of Fe bulk. Total contact hyperfine field and work function of the system were calculated to be -168 kG, and 4.59 eV, respectively. Charge and spin densities, and layer projected density of states are presented to discuss effects of band hybridization between Fe and Mo atoms on the magnetism of Fe.

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SPIN POLARIZATION IN DILUTE ALLOY OF Cu-[Fe,Co,Ni] STRUCTURES, KI S. SOHN, B. S. KANG, H. K. LEE and M. J. LEE (Dept. of Physics, Kyungpook National Univ., Daegu 702-701, Korea)

The self-consistent, tight-binding linear muffin-tin-orbitals (TB LMTO) method was employed to study the electronic structures and the magnetic properties of a $Cu_{54}M_1$ embedded clusters of cubic geometry, where M stands for Fe, Co and Ni. At the equilibrium atomic positions of the systems obtained by the total-energy minimization, we calculated the local magnetic moments of the impurity and the spin polarization of the Cu atoms by the adjacent Co or Fe atoms. When the local lattice relaxation was taken into account, it was found that the 3d magnetic moments of Cu are aligned parallel to the 3d magnetic moments of Co[Fe], whereas the 4p magnetic moments of Cu are aligned antiparallel to the 3d magnetic moments of Co[Fe], which is in agreement with the recent experiments on the Co/Cu and the Fe/Cu multilayers.

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Pb- SURFACTANT MEDIATED GROWTH OF Co/Ru SUPERLATTICES BY MBE

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The origin of the giant magnetoresistance in metallic multilayers is ascribed to spin dependent scattering caused by existence of the interfaces. Numerous observations have been reported, indicating that interface roughness plays a important role in the GMR effect. However, no clear picture has yet emerged and the reported data are contradictory.

Recently surfactant epitaxy was introduced as a method of controlling the growth mode to layer by layer mode and successful results was reported. Surfactant epitaxy is useful method to fabricate flat and abrupt interfaces in the metallic multilayer films.

Co/Ru superlattices have the large interlayer coupling energies, however it show relatively smaller GMR ratio. That is caused by the difficulty of crystal growth due to the large lattice misfits between Co and Ru.

Co/Ru superlattices were grown on $Al_2O_3(0001)$ using Pb as a surfactant. As a resusult, MR ratios of Co/Ru superlattices grown with surfactant were increased than that of superlattices without surfactant.

POSTER SESSION