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Cu films on Polyimide deposited by an Ionized Cluster Beam

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Cu films were deposited on polyimide(PMDA-ODA) substrate by ionized cluster beam. The crystallinity of deposited copper films with 1000 Å thickness at different ionization potential showed preferred orientation along Cu <111> axis, and the crystallinity was changed by ionization potential, but the crystallinity of the films grown by thermal evaporation was changed by annealed temperature and times. The surface morphology also showed different shapes by ionization potential in ICB and the shapes are compared with the film deposited by thermal evaporation. Cu films was also deposited with 50 Å thickness at different acceleration voltage and chemical bonding with PI was analyzed by XPS. Results obtained in this experiment were compared with those of Cu/PI system, in which copper films were deposited by thermal evaporation and annealed at 150 - 250℃ for 10 - 24 hours. Advantages and disadvantages in improving adhesion method such as ion beam mixing, pre-treatment, ion assisted deposition, ICB etc. are discussed.