

Annealing textures of nanocrystalline metallic deposits

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Textures can develop in thin films during deposition and post-deposition annealing. The deposition texture can vary with deposition conditions and may change after annealing. The annealing texture can be classified into recrystallization and grain growth textures. The recrystallization textures are related to dislocation energies. Nanocrystalline metallic deposits whose grain size is of the order of 10 nm or less are devoid of dislocations. Therefore, the annealing textures of the nanocrystalline metallic deposits develop through grain growth during annealing. The grain growth textures can be controlled by grain boundary energy and mobility, surface energy, interface energy, and strain energy. In this paper, annealing textures of nanocrystalline electroless Ni-X-P alloy deposits on 5086 Al alloy sheet, Fe-Ni electrodeposits, and Cu interconnects are discussed based on various controlling factors.