

New pretreatment technique for surface improvement of Ru films in Ru-MOCVD

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The effects of Pd activation on Ruthenium (Ru) films grown by metalorganic chemical vapor deposition (MOCVD) using a bis(ethyl- π -cyclopentadienyl) ruthenium [Ru(EtCp)₂] as a precursor were investigated. Displacement-deposited Pd particles on TiN substrate play a role of active sites for Ru nucleation. The growth rate was increased as the decomposition of Ru(EtCp)₂ was promoted by Pd activation prior to Ru deposition. Moreover, Pd particles dramatically enhanced Ru nucleation at the early stage and the surface roughness of the films considerably reduced. From these results, the possibility of Pd activation as a new pretreatment technique for Ru nucleation in Ru-MOCVD is proposed.