【TP-10】

# MOCVD growth of $RuO_2$ thin films on Si(001) substrates using($\eta^6$-benzene)($\eta^4$-1,3-cyclohexadiene)Ru

H.-N. Hwang, K. C. Han, K.-S. An, S. S. Lee, T.-M. Chung, Y. Kim
Thin Film Materials Laboratory, Advanced Materials Division, Korea Research Institute of Chemical Technology

Ruthenium oxide thin films were deposited on Si(001) substrates using ($\eta^6$-benzene)($\eta^4$-1,3-cyclohexadiene)Ru, Ru(bz)(chd), as a new Ru precursor by low pressure metal organic chemical vapor deposition. Dependence of the film qualities, such as the structural and electrical properties, on the substrate temperature and the oxygen flow rate were systematically investigated using X-ray diffraction (XRD), scanning electron microscopy (SEM), X-ray photoelectron spectroscopy (XPS), atomic force microscopy (AFM) and four-point probe resistivity measurement. Polycrystalline Ru thin film was well deposited at the substrate temperature of 450 ℃ without oxygen flow, where the lowest carbon contamination and resistivity are obtained. With increasing oxygen flow rate at the substrate temeprature of 350 ℃, mixed films of polycrystalline Ru and RuO2 were grown with increasing the grain size and, at the oxygen flow rate of 100 sccm, the films were completely converted to RuO2 with the largest grain size.