

[총회초청 II]

Epitaxial Growth of Y_2O_3 films by Ion Beam Assisted Deposition.

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High quality epitaxial Y_2O_3 thin films were prepared on Si(111) and (001) substrates by using ion beam assisted deposition. As a substrate, clean and chemically oxidized Si wafers were used and the effects of surface state on the film crystallinity were investigated. The crystalline quality of the films were estimated by x-ray scattering, rutherford backscattering spectroscopy/channeling, and high-resolution transmission electron microscopy (HRTEM). The interaction between Y and Si atoms interfere the nucleation of Y_2O_3 at the initial growth stage, it could be suppressed by the interface SiO_2 layer. Therefore, the SiO_2 layer of the 4-6 layers, which have been known for hindering the crystal growth, could rather enhance the nucleation of the Y_2O_3 , and the high quality epitaxial film could be grown successfully.

Electrical properties of Y_2O_3 films on Si(001) were measured by C-V and I-V, which revealed that the oxide trap charge density of the film was 1.8×10^8 C/cm² and the breakdown field strength was about 10 MV/cm.