

Organic-Inorganic Hybrid Thin Film Fabrication as Encapsulation using TMA and Adipoyl Chloride

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We fabricate organic-inorganic hybrid thin film for the purpose of encapsulation by molecular layer deposition (MLD) using Trimethylaluminium (TMA) and Adipoyl Chloride (AC). Ellipsometry was employed to verify self limiting reaction of ALD. Linear relationship between number of cycle and thickness was obtained. We found that desirable organic thin film fabrication is possible by MLD surface reaction in nanoscale. Purging was carried out after dosing of each precursor to form monolayer in each sequence. We also confirmed roughness of the organic thin film by atomic force microscopy. We deposit TMA and AC at 70°C and that 1.78Å root mean square was obtained which indicates that uniform organic thin film was formed. We confirmed precursor's functional group by IR spectrum. We calculated WVTR of organic-inorganic hybrid super-lattice epitaxial layer using Ca test. WVTR indicates superlattice film can be possibly use as encapsulation in flexible devices.

Keywords: Atomic Layer Deposition, Molecular Layer Deposition, Encapsulation