Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information for

Optimization of Al_2O_3/TiO_2 Nanolaminate Thin Films Prepared with Different Oxide Ratios, for use in Organic Light-Emitting Diode Encapsulation, via Plasma-Enhanced Atomic Layer Deposition

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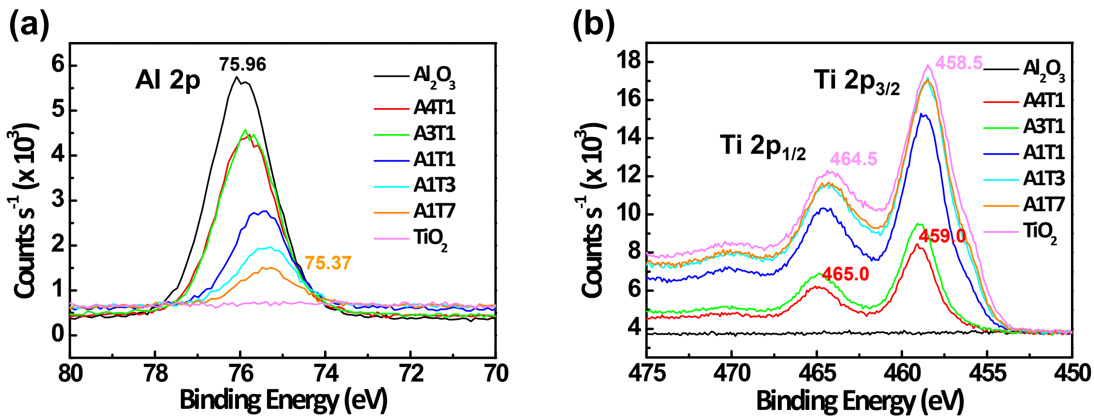

Figure S1. X-ray photoemission (XPS) spectra of the Al_2O_3, TiO_2, and Al_2O_3/TiO_2 nanolaminate films, collected from the (a) Al 2p and (b) Ti 2p core levels.

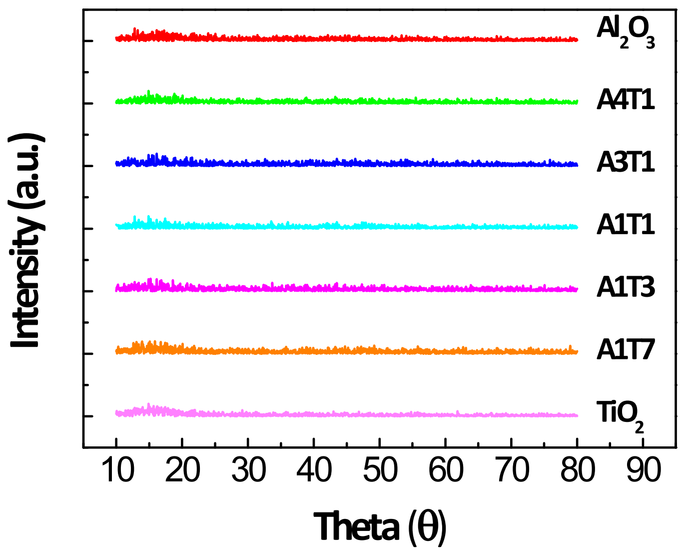

Figure S2. The X-ray diffraction (XRD) spectra of 50 nm thick Al_2O_3, TiO_2, and Al_2O_3/TiO_2 nanolaminate films on glass. No peaks were not detected.

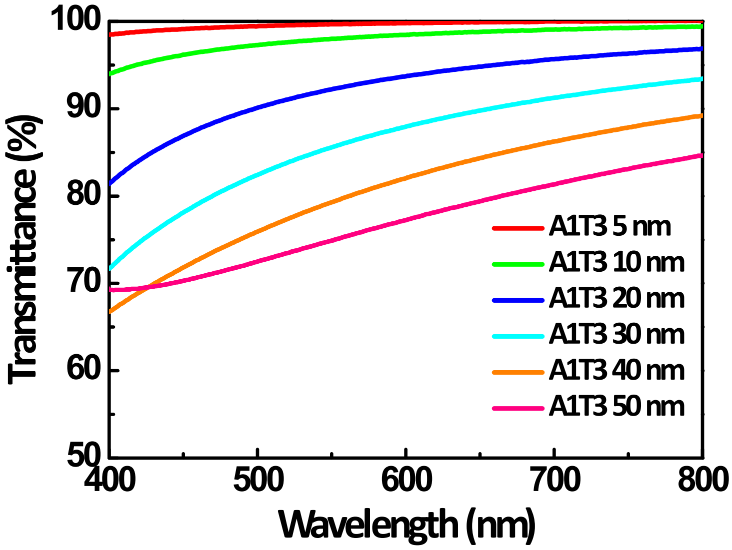

Figure S3. The optical transmittance spectra of the A1T3 films prepared with various thicknesses values.

Table S1. The dielectric constants of the Al_2O_3, TiO_2, and Al_2O_3/TiO_2 nanolaminate films.

PEALD based Film	Dielectric Constant
Al_2O_3	7.9
A4T1	11.5
A3T1	13.6
A1T1	15.4
A1T3	23.8
A1T7	25.4
TiO_2	29.6

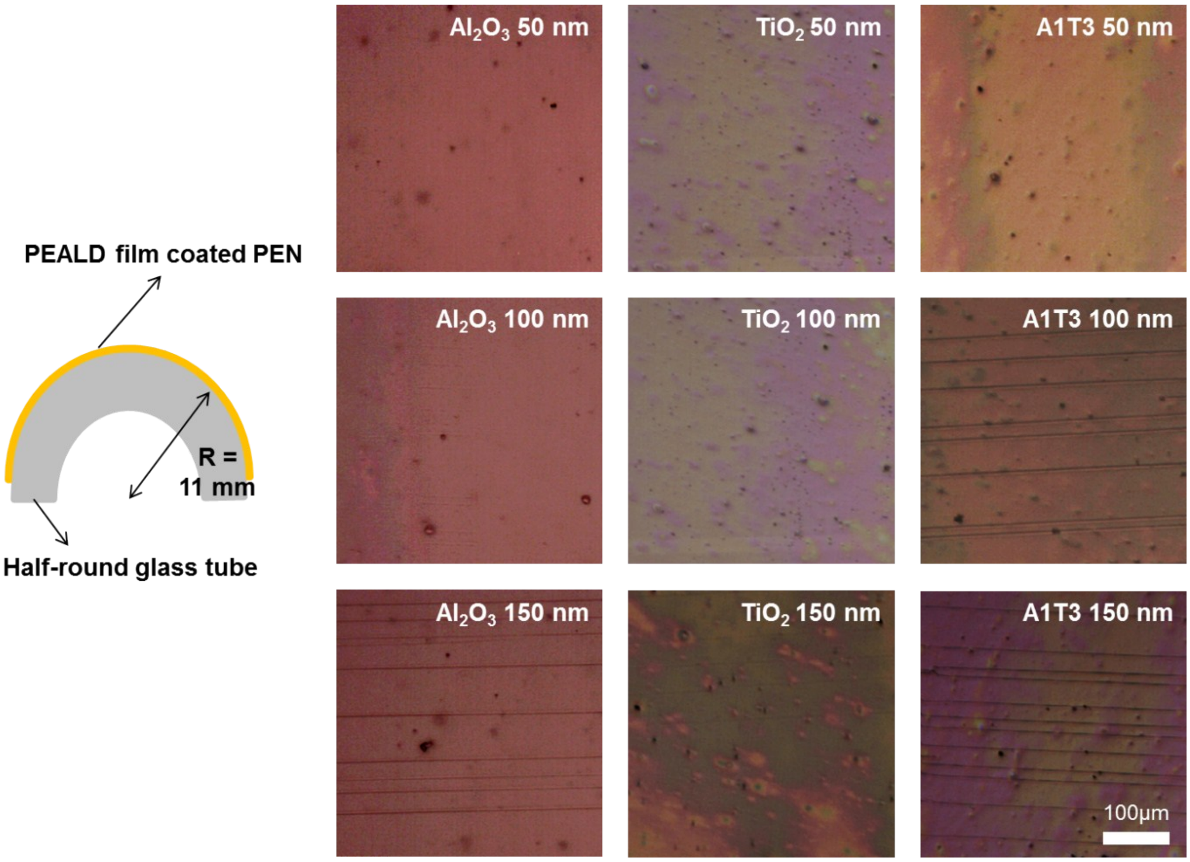

Figure S4. Optical microscope images for PEALD-based films on PEN substrate after 500 times cyclic bending test with a bending radius of 11 mm. Cracks were observed at thickness of 150 nm for all films and 100 nm thick A1T3 film. We confirmed that all PEALD-based films were flexible in less than 50 nm thick at bending radius of 11 mm.

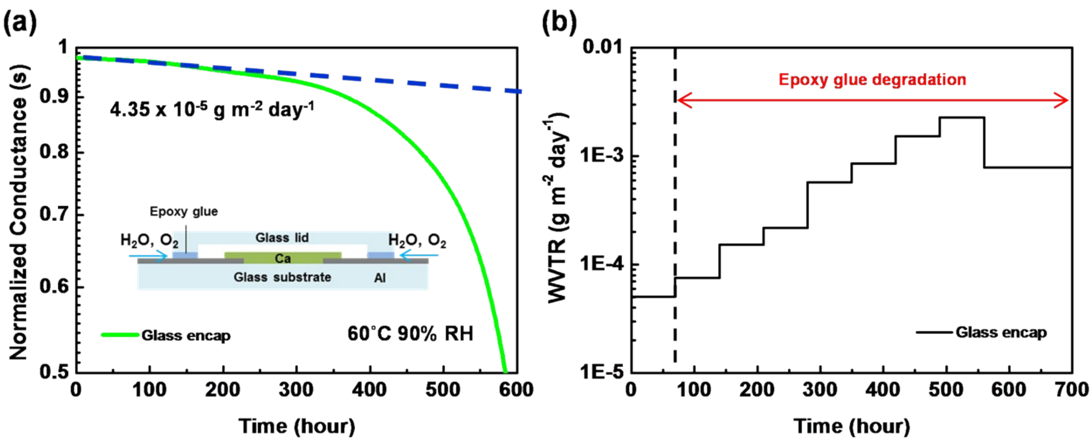

Figure S5. (a) Normalized conductance changes and (b) WVTR values of the glass-encapsulated Ca test cell as a function of time at 60˚C and 90% RH. The inset shows a schematic diagram of the glass-encapsulated Ca test cell.

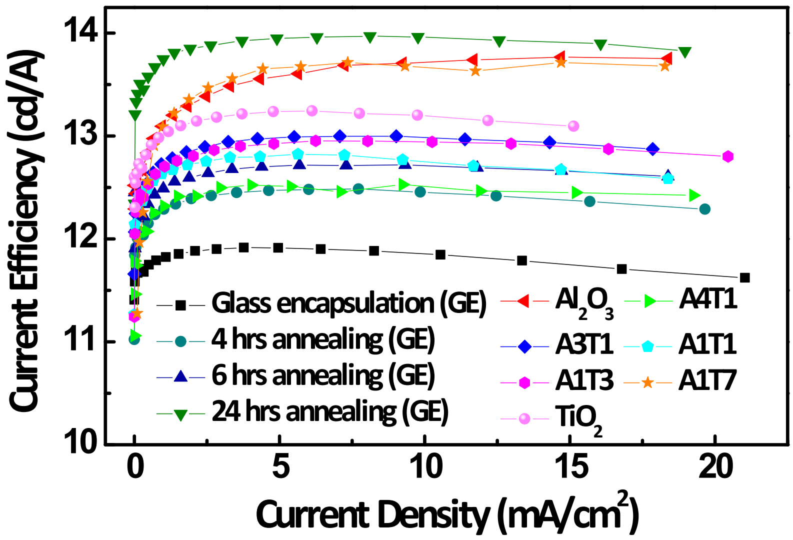

Figure S6. Current efficiencies of the glass-encapsulated devices and the devices passivated with PEALD films.

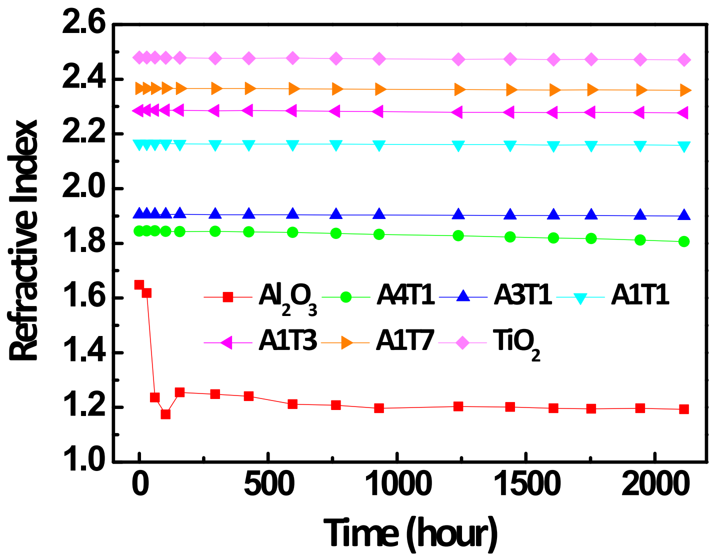

Figure S7. Refractive indices of the 50 nm thick PEALD-based films prepared on a Si wafer over time in water at room temperature. All PEALD films were grown at 100˚C.