

Interface effects on the moisture barrier properties of organic/inorganic hybrid structure

김성희, 이준영†  
성균관대학교

Barrier films coated on flexible substrates are indispensable for LCD or OLED devices, flexible solar modules, materials. We demonstrate an organic/inorganic hybrid thin film encapsulation for OLED using sol-gel method. We consider the inorganic moiety provides moisture barrier property, while the organic moiety improves flexibility of the hybrid layer. Gibbsite( $\gamma$ -Al(OH)<sub>3</sub>) or carbon nanotube (CNT) and Poly(methyl methacrylate) (PMMA) were used as the organic and the inorganic moiety. The solutions were dip coated on the PEN film. We focus our attention on the effect of increasing number of interfaces on the final barrier properties. The encapsulation barrier properties of these layers are assessed using the electrical calcium test. Moisture barrier property was determined by water vapor transmission rate (WVTR) measured by Ca test at 85°C and 85% RH. Water vapor transmission rate (WVTR) of  $\sim 2 \times 10^{-4}$  g/m<sup>2</sup>·day is reported, which has also high potential for flexible barrier applications.