Study on compensation of thermal stresses in multilayered materials

Jin-Woo Han, Jong-Yeon Kim, Byoung-Yong Kim, Jeong-Min Han, Hyun-Chan Moon*, Kwang-Bum Park* and Dae-Shik Seo
Yonsei University, KETI(Korea Electronic Technology Institute)*

Abstract : In recent years, flexible display devices such as liquid crystal display (LCD), organic light emitting diode (OLED), etc. have attracted considerable interest in a wide variety of applications. Polymer substrate is absolutely necessaryto realize this kind of flexible display devices. Using the polymer as a substrate, there are lots of advantages including not only mechanical flexibility such as rolling and bending characteristics but also light weights, low cost and so on. In detail, thickness and weights is only one forth and one second of glass substrate, respectively.

However, it needs low temperature below 150℃ in the fabrication process comparing to conventional deposition process. The polymer substrate is not thermally stable as much as the glass substrate so that some deformation can be occurred according to variation of temperature. In particular, performance of devices can be easily deteriorated by shrinkage of substrate when heating it.

In this paper,pre-annealing and deposition of buffer layer was introduced and studied to solve previously mentioned problems of the shrinkage and followed shear stress.

Key Words : thermal stress, polymer substrate, shrinkage