

Development of elastic pressure sensitive adhesives for flexible electronics

임대균, 백명진, 김학선, 이동욱[†]

UNIST

(dongwoog.lee@unist.ac.kr[†])

Recently, user-oriented electronics have explosively emerged. However, the rigid adhesives used in conventional electronics are unsuitable for assembly of flexible components in wearable devices. Therefore, the development of flexible and restorable pressure sensitive adhesives (PSAs) is important for the commercialization of flexible electronics. In this study, acrylic UV curable PSAs were synthesized by using 2-ethylhexyl acrylate (EHA) as soft monomer and 2-carboxylethyl acrylate (CEA) as functional monomer, which exhibited high peel adhesion and good flexibility. The synthesized film achieved high peel strength (~25 N/25mm) with contact time of 15 min, which increased up to ~35N/25mm with contact time of 24 hrs. The elastic characteristics of the synthesized PSAs were evaluated by repetitive stretching and bending tests. In order to induce elastic characteristic to the PSAs, pre-straining strategy was implemented, which triggered instantaneous strain recovery at the pre-strain of 10%. These PSAs were further tested as epidermal adhesives attached to the wrist, which showed suitability to be used as elastic adhesives without permanent deformation such as wrinkle formation.