

## Improvement of PIN-type Organic Photovoltaic Cell Performance by Using of Pentacene as a Hole Transport Layer

황중원, 박성희, 이해현, 김현수, 최영선\*

부산대학교

(choe@pusan.ac.kr\*)

Photovoltaic cells based on PIN heterojunctions have been fabricated with a structure of ITO / poly(3,4-ethylenedioxythiophene)-poly(styrenesulfonate)(PEDOT:PSS) / pentacene / pentacene:C<sub>60</sub>(10nm) / C<sub>60</sub>(35nm) / 2,9-dimethyl-4,7-diphenyl-1,10-phenanthroline(8nm) / Al(100nm). We have investigated the dependency of the power conversion efficiency on the thickness of pentacene as a hole transport layer in the organic photovoltaic devices with PIN structure. The effect of the thickness of a hole transport layer was elucidated from the device performance characteristics such as photovoltaic response, absorption spectrum and surface morphology. The power conversion efficiency of about 1.92% has been achieved with 55nm thickness of pentacene under standard AM 1.5 illumination (100mW/cm<sup>2</sup>). Over 55nm in hole transport layer thickness, device performance was decreased.