Chemical and Optical Approaches for Highly Stable High-Efficiency Polymer Solar Cells

정재훈, 서주역, 한혜미, 김화정, 김영규†
경북대학교
(ykimm@knu.ac.kr†)

Polymer solar cells have been extensively highlighted for the last two decades because of their advantages, over conventional inorganic solar cells, leading to low-cost flexible plastic solar modules with various shapes. The power conversion efficiency (PCE) has been encouragingly improved up to ~11% for polymer solar cells with either single-stack or tandem structure. This advance can be attributed to brand-new semiconducting polymers and related process technology. However, unfortunately, polymer solar cells are suffering from low stability and lifetime, which prevents the technology shift from R&D phase to commercialization steps. Since 2002, we have devoted our basic research efforts on the investigation of fundamental aspects of such low stability in polymer solar cells. After achieving a high PCE approaching ~11%, we have concentrated on the stability enhancement of polymer solar cells. Very recently, we made considerably stable polymer solar cells by introducing a UV-cut filter as well as our own chemical technology. This presentation will show parts of our long efforts on the stability improvement and discuss the future direction for >10 year lifetime.