

# Polymer Solar Cells: Fundamentals and Recent Trends

Youngkyoo Kim

Organic Nanoelectronics Laboratory, Department of Chemical Engineering, Kyungpook National University

Polymer solar cells have become one of the rising next generation solar cells due to their potential for lightweight and bendable plastic solar modules. Recently, the power conversion efficiency of polymer solar cells has reached  $\sim 8\%$ , which can make  $\sim 6\%$  plastic solar modules when it comes to the modular aperture ratio of  $\sim 80\%$ . Although this efficiency is far behind that of conventional inorganic solar cells, the plastic solar modules are expected to create new energy market into which the inorganic solar modules could not make inroads. In the near future, the plastic solar modules can be integrated with consumer electronics that should overcome the regulation of energy consumption. For this application, the polymer solar cells should be fabricated in a variety of module shapes, which can be resolved by employing conventional and/or advanced coating and molding technologies of plastics products. In this tutorial, the fundamental aspect of polymer solar cells will be briefly introduced and then recent trends in terms of materials and devices will be reviewed together with showing recent results in organic nanoelectronics laboratory.

**Keywords:** Polymer solar cells, Plastic solar modules, Lightweight, Bendable