

Characteristics of All-Polymer Phototransistors for Wide Range Photon Detection

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Optical sensing is of great importance in a broad field of science and technology and has been applied for medical diagnostics, optical communications, monitoring systems, and personal devices. In particular, optical detectors play a critical role in optical sensing systems so that they have been gradually improved in performances and shapes. Recently, most electronic systems are designed to be thin, lightweight and flexible. In order to meet the requirements of such flexible and thin features, organic detectors have been introduced by employing organic semiconducting materials that are advantages over rigid inorganic materials. Of various types of organic detectors, organic phototransistors have been spotlighted because they can be fabricated on flexible substrates at room temperature. For the first time, our group has successfully invented organic phototransistors with polymer:polymer bulk heterojunction layers. Here we present the characteristics of all-polymer phototransistors for the detection of wide range photons and will discuss the advantages of all-polymer phototransistors in advanced chemical engineering processes.