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Effects of the permanent dipole of self-assembled monolayer-treated insulator on the field-effect mobility of a pentacene thin-film transistor

These cells showed a power conversion efficiency of about 3.61% after annealing at 150°C. The open circuit voltage (Voc) of this device was recorded over 0.7 V, which is the highest voltage reported for such a device. We have studied the influence of the annealing temperature on the device performance and found that Voc increases with increasing annealing temperature up to 150°C.

Hysteresis-free organic field-effect transistors and inverters using a photo-curable polymer gate dielectric

Triphenylene-based discotic liquid crystals with reactive acrylate end groups have been synthesized. These materials have a field effect mobility of 0.51 cm²/Vs. In addition, to Insure that our OFETs work well as organic circuitry we made a hysteresis-free organic inverter having a high inverter gain of 17.9.

Improvement of electrical stability of organic thin film transistors by passivation using fluoropolymer

The use of fluoropolymer passivation can significantly improve the electrical stability of organic thin film transistors. This is due to the high dielectric constant and low surface energy of fluoropolymers, which can prevent the penetration of moisture and oxygen into the device.

Electrical characteristics of rubrene single crystal based organic field effect transistor (OFET)

The electrical characteristics of rubrene single crystal based OFETs were studied using various spectroscopic methods. S-linked tetraphenyles showed excimer formation upon excitation. From the anisotropy decay, excitation energy migration among the oligothiophenes was confirmed. The excitation energy migration was discussed on the basis of the incoherent energy hopping mechanism. The effect of conjugation on the present energy transfer was indicated. For the block copolymers of oligothiophene donators, the excitation energy migration was discussed on the basis of the incoherent energy hopping mechanism. The effect of conjugation on the present energy transfer was indicated.

Growth of anthracene crystal using chemical vapor deposition method

The growth of anthracene crystals using chemical vapor deposition (CVD) was studied. The CVD technique was found to be a useful method for the growth of single crystals of anthracene. The growth rate and crystal quality were investigated by X-ray diffraction (XRD) and scanning electron microscopy (SEM). A high-quality crystal was obtained by optimizing the growth conditions.

Low band gap donor-acceptor copolymers

Molecular Design and DFT Calculation of (3-hexylthiophene)-Based Alternating Low Band Gap Donor-Acceptor Copolymers

Thiophene-based materials, such as regioregular poly(3-hexylthiophene), have emerged for the most promising polymers in organic photovoltaics. Up to now, the best energy conversion efficiencies reported in small-area devices approach just 6%. One of the reasons for the low efficiency is the high band gap of conjugated polymer which results in the absorption of UV and green part of the visible range only. Since the wavelengths from 290 to 400 nm amounts to 1.4% of the possible photon flux, biased absorption contributes small photocurrent to photovoltaics. Therefore lowering the band gap of polymer is of crucial importance for increasing the efficiency. In this study, we design new organic polymers based on alternating donor-acceptor copolymers, and the structures of these polymers are optimized by using the DFT. From the analysis of the energy level, it was concluded that the new alternating donor-acceptor copolymers have low band gaps and these are applicable to highly efficient photovoltaics.