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fluoropolymer melts. The fluorinated latex particles were prepared from conventional emulsion polymerizations. The surface properties of the latex films were characterized with various methods such as contact angle measurement, sliding angle measurement and atomic force microscopy.

한정조

Polymer Science Research Institute, Korea

1PS-202

Dulbadeh factor binding protein can regulate cell cycle progression in cancer cells. The Dulbadeh factor (DF) and its regulation in the cell cycle are still not fully understood. In this study, we used a cell-based assay to determine the regulation of DF in cancer cells. Our results suggest that DF is a potential therapeutic target for cancer treatment.

한정조

Preparation and Characterization of Polypropylene/Polylactic acid Blend Fibers with Enhanced Dyeing Property

Because of its low cost, low density, good chemical resistance, and good processability, polypropylene (PP) is widely used in the plastic and fiber industries. However, unmodified polypropylene fiber cannot be dyed due to the high crystallinity and absence of dyes in the molecular chain. In this study, poly(lactic acid) (PLA) was blended with PP during melt-spinning process to impart PP fiber dyeing property. Changes in morphology, mechanical strength, and dyeing properties of the blended PP fibers according to the amount of PLA were examined. SEM analysis showed that PLA existed as beads in PP matrix, the number and size of which increased with increasing PLA content. PP/PLA blend fibers exhibited enhanced dyeing property, i.e., they could be dyed with dispersible dyes. This value, indicating apparent dye absorption of the samples, increased with increasing PLA content in the blend fibers.

한정조

1PS-204

MWNT-Reinforced Poly(styrene sulfide) Nanocomposites

Poly(styrene sulfide) (PSS) is a multi-wall carbon nanotube (MWNT) nanocomposite prepared by mixing PSS with MWNT or surface-modified MWNT at 300 °C by using a twin-screw extruder. The extrudates were melt-pressed to films and quenched in ice-water. SEM analysis on the density of MWNT in PSS matrix showed that surface-modified MWNT dispersed more evenly than pristine MWNT. Doping with strong oxidants is usually used to increase electrical conductivity of PSS, which may accompany chemical reaction or decomposition of PSS. Addition of MWNT as a filler for PPS films results in the increase in electrical conductivity without any side reactivities. Effects of the addition of MWNT on the crystallization and mechanical properties of PSS were also investigated.

한정조

1PS-205

Synthesis and Characterization of Poly(styrene sulfide)-Grafted Multi-Walled Carbon Nanotubes

Generally, poly(styrene sulfide) (PSS) is synthesized from sodium sulfide and dichlorobenzene at high temperature and high pressure in polar solvents via a conventional condensation polymerization method. In this study, PSS was synthesized from 4-chlorobenzonitrile (CBT) via a self-condensation polymerization method in N-methyl-2-pyrrolidone as a solvent. PPS-grafted multi-walled carbon nanotubes (PPS-g-MWNT) were prepared using CBM and CBT for the 4-chlorobenzonitrile (CBT) conversion. Changes in the thermal and electrical properties of PPS and PPS-g-MWNT were analyzed. Electrical conductivity of PPS and PPS-g-MWNT films increased with the addition of MWNT and doping with Ag++. Temporal strength retention of the PPS and PPS-g-MWNT films immersed in some acidic (10% of HNO3 and H2SO4) solutions at 93 °C for 7 days were exhibited almost 100%.

한정조

1PS-210

High Extraction Efficiency PLEDs Using a 2D Titania Inverse Opal Film

For the past several years, many research groups have shown interest in Polymeric Light Emitting Diodes (PLEDs) for the next generation display due to the low power consumption, the next last time, the wide viewing angle and the simple process of fabrication. In this research area, the high extraction efficiency is one of key points for getting good performance PLEDs. However, in this report, it was reported that just 20% of the emitted light from a T-shaped slit 2 can escape the device as useful radiation. And another 40% of the light is lost useless because of total internal reflection at the boundaries of layers with different refractive indices. To extract these wavelength light, we introduced a 2D titania inverse opal film which consists of a regular arrangement of spherical void spaces containing air and solid walls. Due to the uniform arrangement of air and solid walls with a high refractive index, it has a photonic crystal property. Using this structure, we enhanced the extraction efficiency.

한정조

Homopolymer Distributions in Ordered Block Copolymers

Homogeneous, block, non-linear, and inorganic polymers with symmetric block copolymers were analyzed by neutron reflectivity. In a thin-film geometry, these distributions form alternating lamellar microdomains oriented parallel to the substrate surface. By adding deuterated homopolymer or copolymer to the labeled copolymer, the spatial distribution of the homopolymer was characterized quantitatively. When the molecular weight of the homopolymer is comparable to the block molecular weight, the homopolymer is confined to the corresponding copolymer domains. With decreasing molecular weight, the homopolymer is more uniformly distributed within the domains. When the molecular weight of the homopolymer is much larger than the block molecular weight, the homopolymer is excluded from the lamellar microdomain, but does not interfere with the preferred lamellar orientation and is incorporated into the multilayered morphology.

한정조

Effect of Polyphylelic Oligomeric Silsesquioxanes (POSS) on Polyethylene-terephthalate (PET) Nanohybrids

Polyethylene-terephthalate (PET) is a well-known polymer that is used for a variety of applications. In this study, polyethylene-terephthalate (PET) nanohybrids were prepared by mixing POSS with PET. The POSS concentration in the PET matrix was varied from 5 to 20 wt%. The mechanical properties of the POSS/PET nanohybrids were investigated. The POSS/PET nanohybrids showed improved tensile strength and modulus compared to the pure PET. The POSS/PET nanohybrids also showed improved thermal stability compared to the pure PET. These results suggest that POSS can be used as a filler to improve the mechanical properties of PET. Moreover, POSS/PET nanohybrids can be used as a reinforcement material in various applications.

한정조

1PS-208

Nanocomposites

Nanocomposites are materials that are composed of two or more components, where one component is a nanometer scale. The most common nanocomposites are polymer-nanofiller composites. Nanofillers include nanoparticles, nanotubes, and nanofibers. Nanocomposites have many applications in various fields such as electronics, biomedical, and environmental. In this study, we investigated the mechanical properties of polymer-nanofiller composites. The results showed that the mechanical properties of the composites were enhanced by the addition of nanofillers. This suggests that nanocomposites can be used as a reinforcement material in various applications.

한정조

1PS-209

Nanotechnology

Nanotechnology is an interdisciplinary field that deals with the study of materials at the nanometer scale. The field of nanotechnology has seen significant growth in recent years, with many applications in various fields such as electronics, medicine, and energy. In this study, we investigated the potential applications of nanotechnology in the field of energy. The results showed that nanotechnology can be used to improve the efficiency of energy conversion devices. This suggests that nanotechnology has the potential to play a significant role in the future of energy production and distribution.

한정조

1PS-211

Fabrication of Nanostructured Multilayers from Crosslinked Block Copolymers

This research reveals that crosslinked block copolymers (CBPs) are a versatile class of materials for the fabrication of nanostructured multilayers. Crosslinked block copolymers have been used in various applications such as drug delivery, separation membranes, and electronic devices. In this study, we demonstrated the fabrication of nanostructured multilayers from crosslinked block copolymers. The results showed that the multilayers have a well-defined structure and can be controlled by changing the composition of the block copolymers. This suggests that crosslinked block copolymers have the potential to be used in a variety of applications.