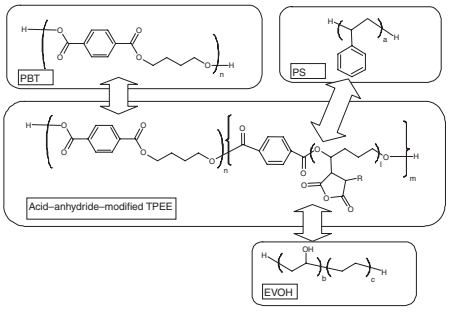
AWARD ACCOUNTS

SPSJ Award Accounts

Material Design and Manufacture of a New Thermoplastic Polyester Elastomer

Thermoplastic polyester elastomer (TPEE) containing polytetramethyrene glycol (PTMG) adhere to many plastics, including PS, ABS, PC, etc. Furthermore, TPEE modified with acid anhydride bind to polyester with gas barrier resins such as EVOH. This adhesion has been used to create many new multi-layer articles.

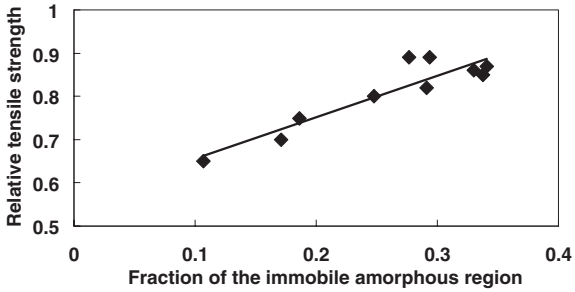


J. MAYUMI, A. NAKAGAWA, K. MATSUHISA, H. TAKAHASHI, H. TAKAHASHI, and M. IIJIMA
Vol. 40, No. 1, pp 1–9 (2008)

REGULAR ARTICLE

A Study of the Relationship between the Tensile Strength and Dynamics of As-spun and Drawn Poly(glycolic acid) Fibers

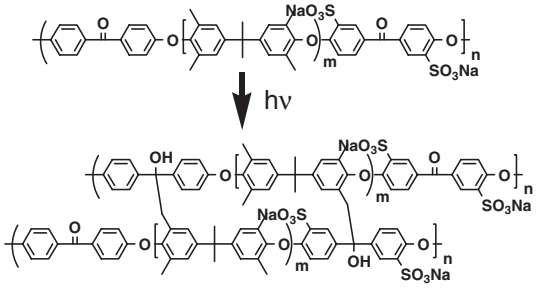
The immobile amorphous region as obtained from 10 kinds of drawn PGA fibers with different drawing ratios, which were obtained from the difference between the fractions of the short T_2 components by solid-echo ^{1}H NMR at 120 and 160 °C. It was found that the fraction of the corresponding immobile amorphous region is closely related to the ratio of the tensile strength after hydrolytic acceleration test to that before hydrolytic acceleration for PGA fibers.



S. SEKINE, H. AKIEDA, I. ANDO, and T. ASAKURA
Vol. 40, No. 1, pp 10–16 (2008)

Sulfonated Poly(aryl ether ketone) Random Copolymers Having Crosslinking Structure for Proton Exchange Membrane of Fuel Cell

New class of aromatic poly(aryl ether ketone)s (PAEKs) having pendant sulfonate groups and methyl groups were synthesised for proton exchange membrane (PEM) of fuell cell. The benzophenone group and the methyl group in these PAEKs were easily changed into a crosslinked bond by UV irradiation. The crosslinking of these PAEKs membranes improved their methanol blocking properties that are required as the important properties for PEMs of direct methanol fuel cell.

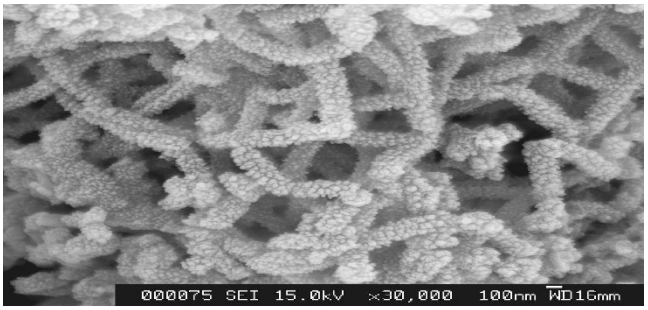


S. FUJIYAMA, J. ISHIKAWA, T. OMI, and S. TAMAI
Vol. 40, No. 1, pp 17–24 (2008)

Polymer Journal

Development and Investigation of Polyaniline Micro/nanocomposites that Possess Moderate Conductivity, Dielectric and Magnetic Properties

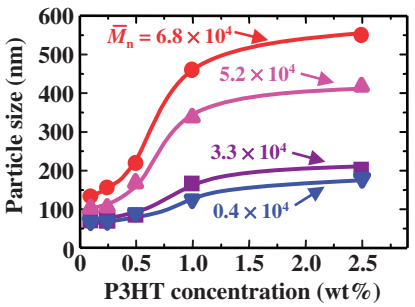
Doped polyaniline micro/nanocomposites containing TiO_2 and Fe_3O_4 (PAni/HA, PAni/HA/TiO_2 and PAni/HA/TiO_2/Fe_3O_4) were successfully synthesized through template free method under various polymerization conditions. Nanorods/tubes shown in SEM images indicate that PAni exhibited polymerization through elongation. PAni synthesized at 0 °C resulted large amount of nanorods/tubes compared with those synthesized at 25 °C. PAni/HA/TiO_2/Fe_3O_4 posses moderate conductivity, high dielectric constant (or negative dielectric constant) and high magnetization that suitable to apply as nanodevices in microwave absorbing and shielding field were successfully synthesized.



S.-W. PHANG and N. KURAMOTO
Vol. 40, No. 1, pp 25–32 (2008)

Preparation and Characterization of Water Self-dispersible Poly(3-hexylthiophene) Particles

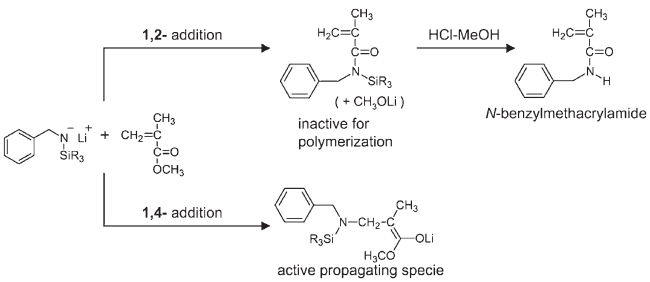
Stable aqueous dispersions of poly(3-hexylthiophene) (P3HT) can be obtained by adding a tetrahydrofuran solution of P3HT into a large amount of distilled water. According to the particle size analysis by transmission electron microscopy, the particle size was found to increase with an increase in the concentration and number-average molecular weight of P3HT. The size of the particles can also be controlled in the range of 50 to 600 nm by varying polymer concentration and molecular weights.



H. SHIMIZU, M. YAMADA, R. WADA, and M. OKABE
Vol. 40, No. 1, pp 33–36 (2008)

Anionic Polymerization of (Meth)acrylates with Trialkylsilyl-protected Lithium *N*-Benzylamide

Polymerization of (meth)acrylates initiated with a novel functional anionic initiator, lithium *N*-benzyltrimethylsilylamide (BnTMSNLi), was suitable for the synthesis of amino end-functionalized polymers. Analysis of polymerization byproducts revealed that occurrence of 1,2-addtion to MMA in the initiation step to form methacrylamide speicies, though the reaction did not affect the polymerization control. Complete surpression of the 1,2-addition was realized by using lithium *N*-benzyltriisopropylsilylamide (BnTIPSNLi).



T. KITAURA and T. KITAYAMA
Vol. 40, No. 1, pp 37–45 (2008)

Polymer Journal

Synthesis and Thermotropic Liquid Crystalline Behavior of Novel Main-Chain Poly(aryl ether ketones) Copolymer Containing Phthalazinone Moiety and Biphenyl Mesogen

A novel nematic thermotropic liquid crystalline poly(aryl ether ketones) copolymer was successfully prepared by a high temperature solution polycondensation reaction with DHPZ, BP and BFBB in the presence of potassium carbonate. The copolymer exhibited thread-like texture when melted at 410 °C for 10 min, then cooled to 320 °C at 10 °C min^{-1}, and maintained at 320 °C for 1 h, and a chracteristic schlieren texture was observed when shear forces were induced at this temperature.

Q. SUN, J. WANG, K. JIN, G. SU, G. LI, and X. JIAN
Vol. 40, No. 1, pp 46–49 (2008)

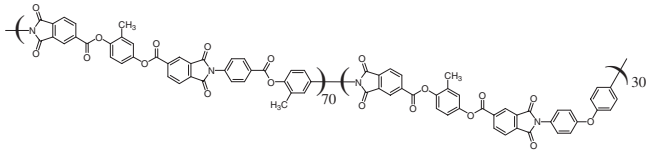
Polymer Nanocomposite of Mg-Al Hydrotalcite-Type Anionic Clay Modified with Organosulfate

The partially exfoliated polymethylmethacrylate (PMMA) and intercalated polystyrene (PS)/MHT nanocomposites have been prepared via solution, melt blending and *in situ* polymerization in the presence of sodium dodecylsulfate as a modifier. The partially exfoliated PMMA/MHT nanocomposites were obtained even at the 5 wt % MHT loading, and the tensile strength was improved with respect to pristine PMMA. The decomposition temperature of PS/MHT was 35 °C higher than that of neat PS.

K. B. YOON, Y. Y. HWANG, S. K. NOH, and D. H. LEE
Vol. 40, No. 1, pp 50–55 (2008)

Poly(ester imide)s Possessing Low CTE and Low Water Absorption (II). Effect of Substituents

Novel polyimide CTE = 17.8 ppm/K, T_g = 363 °C, Water absorption = 0.47%, Elongation at break = 41%.

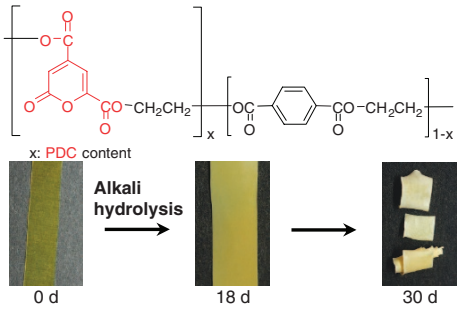


M. HASEGAWA, Y. TSUJIMURA, K. KOSEKI, and T. MIYAZAKI
Vol. 40, No. 1, pp 56–67 (2008)

Polymer Journal

Polyesters of 2-Pyrone-4,6-Dicarboxylic Acid (PDC) Obtained from a Metabolic Intermediate of Lignin

Polyesters of 2-pyrone-4,6-dicarboxylic acid (PDC), a chemically stable metabolic intermediate of lignin, were for the first time prepared by polycondensation with 1,2-ethanediol, 1,3-propanediol, and bis(2-hydroxyethyl) terephthalate. The polyesters were insoluble in common organic solvents when the number-average molecular weight exceeded about 4×10^3. The strain-stress measurements indicated the high Yong's modulus of 250 MPa. The hydrolysis tests revealed that the degradability of the polyesters is dependent on the PDC content in the polymers.



T. MICHINOBU, M. HISHIDA, M. SATO, Y. KATAYAMA, E. MASAI, M. NAKAMURA, Y. OTSUKA, S. OHARA, and K. SHIGEHARA

Vol. 40, No. 1, pp 68–75 (2008)