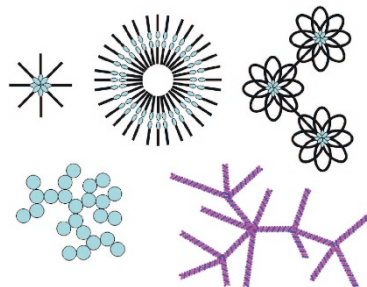


AWARD ACCOUNTS

SPSJ Award Accounts

Macromolecular Assemblies in Solution: Characterization by Light Scattering

Associating polymers, bearing functional groups of strong attractive interactions (hydrophobic, solvophobic, electrostatic interactions as well as hydrogen-bonding), form various types of macromolecular assemblies in solution. The present review article overviews light scattering studies providing important structural information of the following macromolecular assemblies: polymer living anions in a non-polar solvent, amphiphilic telechelic polymer and block copolymers in aqueous solution, and a thermally denatured double-helical polysaccharide aggregated after renaturation.

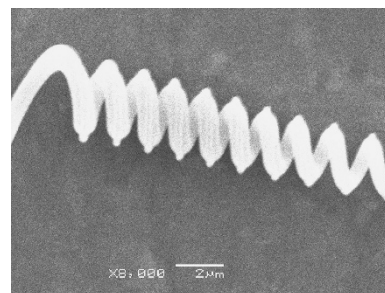


T. SATO and Y. MATSUDA
Vol. 41, No. 4, pp 241–251 (2009)

SHORT COMMUNICATION

Curled Poly(ethylene glycol terephthalate)/Poly(ethylene propanediol terephthalate) Nanofibers Produced by Side-by-side Electrospinning

The scanning electron microscopy (SEM) image of the electrospun HSPET/PTT nanofibers shown in the graphic indicates that the as-spun fibers have curly and helically crimped fiber morphologies. The average fiber diameter of the HSPET/PTT nanofiber is 800 nm, and the diameter of helix is about 1–1.5 μm , simultaneously the thread pitch of the helical structure is only about 1.5 μm that the whole fiber present a morphology of tight spring.

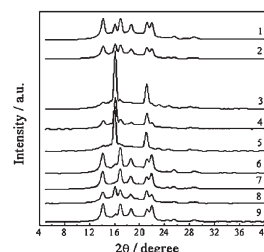


B. ZHANG, C. LI, and M. CHANG
Vol. 41, No. 4, pp 252–253 (2009)

REGULAR ARTICLE

Effect of a Novel Family of *N,N'*-Diphenyl Bisamides on the Formation of β Crystalline Form in Isotactic Polypropylene

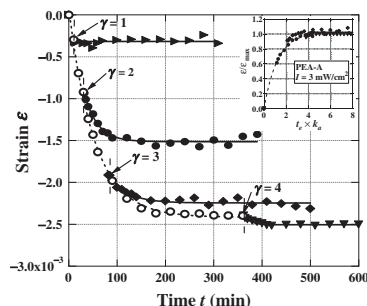
WAXD diffraction spectra of iPP nucleated by 0.1 wt% *N,N'*-diphenyl bisamide compounds. *N,N'*-diphenyl succinamide (DPS), *N,N'*-diphenyl glutaramide (DPG) and *N,N'*-diphenyl adipamide (DPA) are good β nucleating agents for iPP. 1: blank iPP; 2: DPM; 3: DPS; 4: DPG; 5: DPA; 6: DPH; 7: DPO; 8: DPN; 9: DPD.



Q. LU and Q. DOU
Vol. 41, No. 4, pp 254–259 (2009)

Physical Aging of Photo-Crosslinked Poly(ethyl acrylate) Observed in the Nanometer Scales by Mach-Zehnder Interferometry

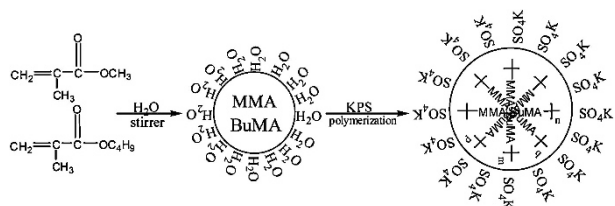
A Mach-Zehnder interferometer was used to detect the strain generated in a photo-crosslinked poly(ethyl acrylate) derivative that undergoes transition from the melt to the glassy state upon irradiation with UV light. The aging kinetics can be simply expressed by an exponential function of time and exhibits a general behavior for different cross-link densities.



D.-T. VAN-PHAM, K. SORIOKA,
T. NORISUYE, and Q. TRAN-CONG-MIYATA
Vol. 41, No. 4, pp 260–265 (2009)

Controlled Particle Size and Synthesizing Mechanism of Microsphere of Poly(MMA-BuMA) Prepared by Emulsion Polymerization

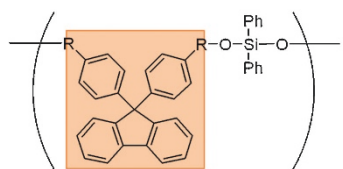
Emulsifying polymerization in this article can be carried out by the intermediate mechanism of emulsifying polymerization and emulsifier-free polymerization. The oligomer-micellar nucleation theory of emulsifier-free polymerization does not conform to the reality mentioned in this article.



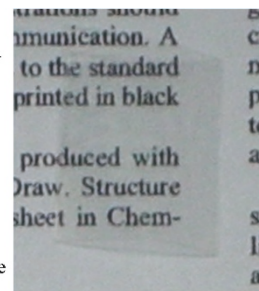
Y. FENG, S. HUANG, and F. TENG
Vol. 41, No. 4, pp 266–271 (2009)

Synthesis and Properties of Polysiloxanes Possessing 9,9-Diarylfuorene Structure in the Main Chain

Polysiloxanes possessing 9,9-diarylfuorene moieties (F-PSiOs) were synthesized in 83–91% yield by the polycondensation of 9,9-bis(hydroxyaryl or hydroxyethoxyphenyl)fluorenes with Ph_2SiCl_2 . The F-PSiOs showed good solubility, high 5% weight loss temperature (443–544 °C), and low glass transition temperature (100–171 °C). The transmittance of F-PSiOs reached over 90% in the visible light region. The F-PSiOs exhibited remarkably high refractive index values in a range of 1.64–1.66 at 589 nm in addition to the zero birefringence.



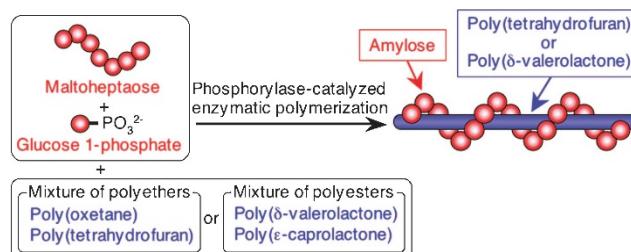
High Solubility, High Thermal Stability
Low T_g , High Transparency
High Refractive Index, No Birefringence



H. HAYASHI, S. KAWASAKI, K. KOBORI,
Y. KOYAMA, S. ASAI, and T. TAKATA
Vol. 41, No. 4, pp 272–278 (2009)

Selectivity and Priority on Inclusion of Amylose toward Guest Polyethers and Polyesters in Vine-Twining Polymerization

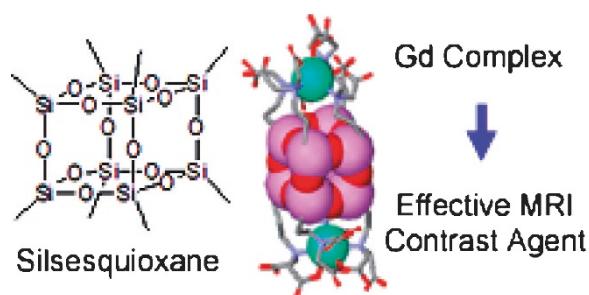
We found that amylose selectively included poly(tetrahydrofuran) (PTHF) or poly(δ -valerolactone) (PVL) from a mixture of two resemblant polyethers, poly(oxetane) (POXT) and PTHF, or a mixture of two resemblant polyesters, PVL and poly(ϵ -caprolactone) (PCL), in phosphorylase-catalyzed enzymatic polymerization of α -D-glucose 1-phosphate from maltoheptaose as a primer in the presence of the aforescribed mixtures. In addition, we evaluated the priority on inclusion of amylose toward these guest polymers in the vine-twining polymerization method to be PTHF > PVL > POXT > PCL.



Y. KANEKO, K. BEPPU, T. KYUTOKU, and J. KADOKAWA
Vol. 41, No. 4, pp 279–286 (2009)

Improving Proton Relaxivity of Dendritic MRI Contrast Agents by Rigid Silsesquioxane Core

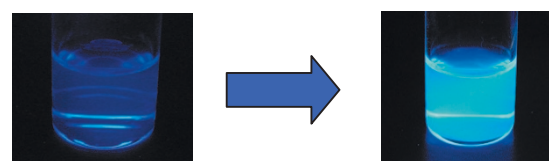
We describe cubic octameric polyhedral oligomeric silsesquioxanes (POSS)-core dendrimers used as chelators with Gd^{3+} ions for highly-sensitive positive MRI contrast agents. We show that the rigidity of the POSS core contributed to the enhancement of the relaxation of water tissue. Finally, the detection limits were approximately 100-fold improved than those of DOTA and DTPA-Gd complexes in the MR images.



K. TANAKA, N. KITAMURA, K. NAKA, M. MORITA,
T. INUBUSHI, M. CHUJO, M. NAGAO, and Y. CHUJO
Vol. 41, No. 4, pp 287–292 (2009)

A Novel Fluorescent Fluoride Chemosensor Based on Unmodified Poly(amidoamine) Dendrimer

The methanol solution of G4.5 COONa-terminated PAMAM dendrimer displayed strong blue luminescence ($\lambda_{max} = 445$ nm) under UV irradiation at 370 nm and fluorescence intensity increased with fluoride ions. On the other hand, the remarkable changes of fluorescence spectra of the dendrimer solutions were not observed in the presence of other halogen anions (Cl^- , Br^- , and I^-). This result suggested that the PAMAM dendrimer is useful as fluoride ion selective sensor in protic solvent.



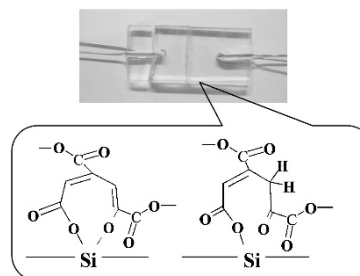
Before Addition of F^-

After Addition of F^-

D. YAMAJI and Y. TAKAGUCHI
Vol. 41, No. 4, pp 293–296 (2009)

Polyesters of 2-Pyrone-4,6-dicarboxylic Acid (PDC) as Bio-based Plastics Exhibiting Strong Adhering Properties

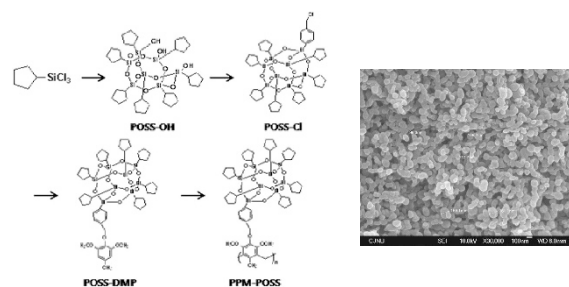
Polyesters of 2-pyrone-4,6-dicarboxylic acid (PDC) and its bis(hydroxyethyl) derivative (BHPDC) and bis(hydroxyethyl) terephthalate (BHT) exhibited strong adhering properties against metal and glass surfaces such as 50–60 MPa by the JIS K 6849:1994 testing method of tensile strength. As the fracturing plane was midst of the polyester layer and at the interface, the polyester was tenaciously adhering to the metal surface.



M. HISHIDA, K. SHIKINAKA, Y. KATAYAMA, S. KAJITA, E. MASAI, M. NAKAMURA, Y. OTSUKA, S. OHARA, and K. SHIGEHARA
Vol. 41, No. 4, pp 297–302 (2009)

Synthesis and Characterization of Hybrid Poly(phenylenemethylene) Having Functionalized Silsesquioxanes (POSS)

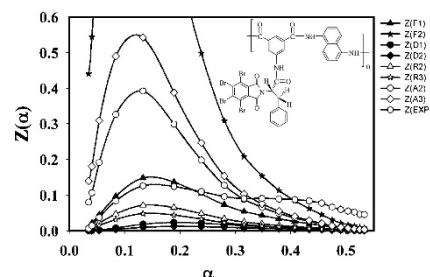
New hybrid poly(phenylenemethylene) with functionalized polyhedral oligomeric silsesquioxanes (PPM-POSS) was prepared by the reaction of POSS-DMP and paraformaldehyde. PPM-POSS shows very uniform distribution of spherical particles with a mean diameter around 100 nm by reducing the degree of interchain aggregation. The thermal stability of PPM-POSS is much higher than that of PPM-Benzyl with no POSS units due to inorganic POSS units of PPM-POSS.



Y.-C. AN, J.-H. JEON, S. W. LEE, B.-G. MIN, J.-H. LIM, and K.-M. KIM
Vol. 41, No. 4, pp 303–307 (2009)

Kinetics and Thermal Degradation Study of Optically Active and Thermally Stable Aromatic Polyamides with Flame-Retardancy Properties

Optically active aromatic polyamides (PA)s with flame-retardancy properties were prepared by two methods (microwave irradiation as well as conventional heating). Resulting polymers presented high thermal stability, with the decomposition temperature being above 400 °C, although slightly diminished compared with that of related aromatic PAs which do not contain any pendent groups. Furthermore, the interpretation of kinetic parameters (E , ΔS , ΔG , ΔH , half-life time, the lifetime and reaction mechanism) of thermal decomposition stages of aforementioned PAs have been evaluated.

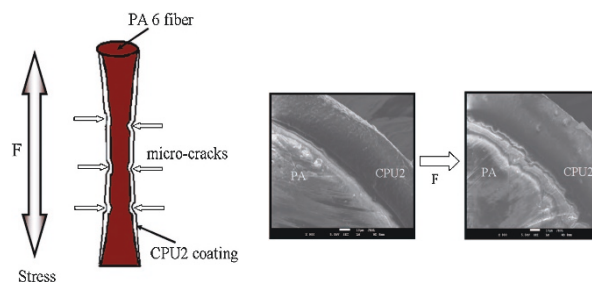


S. MALLAKPOUR and M. TAGHAVI

S. MALLAKPOUR and M. TAGHAVI
Vol. 41, No. 4, pp 308–318 (2009)

High Performance Polyamide 6 Fibers Using Polycarbonate Based Thermoplastic Polyurethane Thin Film Coatings- a Novel Method

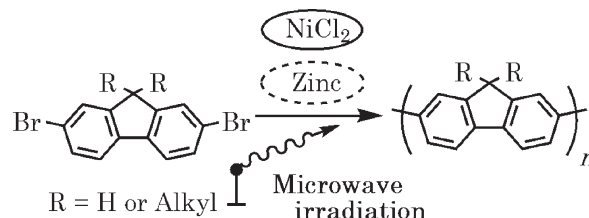
It is considered that the break of PA 6 fibers is due to the formation micro-cracks on the fiber surface when it is under a tensile load. A thin film coating of thermoplastic polyurethane onto the PA 6 fibers reduced the formation of micro-cracks during elongation process, resulting in the improvement of the mechanical properties.



B. JOHN, K. KOJIO, and M. FURUKAWA
Vol. 41, No. 4, pp 319–326 (2009)

Microwave-Assisted Preparation of Poly(fluorene)s by Ni-Catalyzed Polymerization

A series of poly(fluorene)s was prepared by Ni-catalyzed polymerization under microwave irradiation. Compared to the oil heating bath method, microwave irradiation of 2,7-dibromofluorenes produced poly(2,7-fluorene)s with a high molecular weight and yield in a short time. Hence, the microwave irradiation method effectively shortened the reaction time and increased the molecular weight of the prepared poly(fluorene)s.

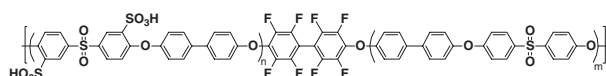


S. MIYAMOTO, S. TANAKA, J. SUGIYAMA, K. MACHIDA,
S. SUEMATSU, and K. TAMAMITSU
Vol. 41, No. 4, pp 327–331 (2009)

NOTE

Influence of Polymer Structure in Sulfonated Block Copoly(ether sulfone) Membranes for Fuel Cell Application

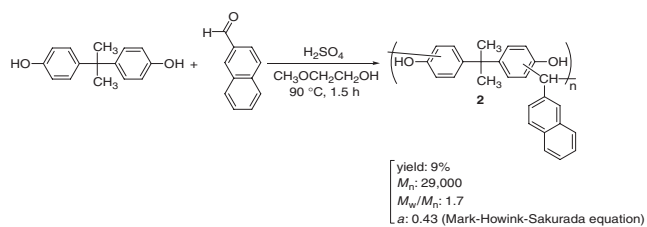
Sulfonated random and alternating multiblock copoly(ether sulfone)s with same chemical compositions were prepared by chain extended method and end-capping method, respectively. The influence of the polymer structure on membranes' properties, such as water uptake and proton conductivity were investigated.



K. NAKABAYASHI, K. MATSUMOTO,
T. HIGASHIHARA, and M. UEDA
Vol. 41, No. 4, pp 332–337 (2009)

Synthesis and Properties of a High-Molecular-Weight Organosoluble Bisphenol A Novolac

A high molecular weight novolacs by addition-condensation of bisphenol A with aromatic aldehyde such as benzaldehyde and 2-naphthaldehyde is described. The obtained polymer was well-soluble in THF and acetone, but insoluble in chloroform and hexane. The number-average molecular weight (M_n) and the polydispersity index (M_w/M_n) of bisphenol A–2-naphthaldehyde novolac (**2**) were 29000 and 1.7, respectively. The aromatic moieties on the side chain of the polymers seemed to exhibit hydrophobic properties and good solubility, and accordingly, the obtained polymers are expected to have high molecular weights.



T. NEMOTO, I. AMIR, and G. KONISHI
Vol. 41, No. 4, pp 338–342 (2009)