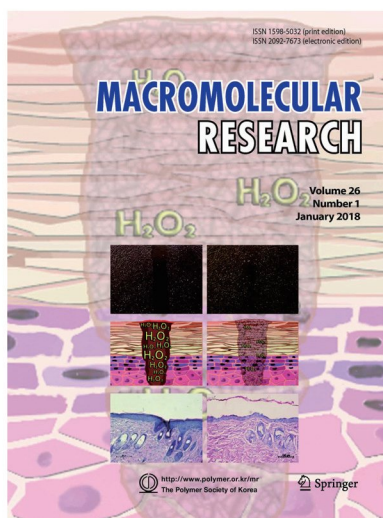


## COVER PAPER

### Hydrogen Peroxide-Responsive Engineered Polyoxalate Nanoparticles for Enhanced Wound Healing

S. V. Berwin Singh, Hoyeon Park, Gilson Khang, and Dongwon Lee\*

Vol. 26, No. 1, pp 40-47 (2018) | JAN 25, 2018 | DOI 10.1007/s13233-018-6003-6



Abnormal level of  $H_2O_2$  could inactivate enzymes, affect the cell viability and impair wound healing. Vanillyl alcohol-incorporating polyoxalate (PVAX) nanoparticles scavenge excessive  $H_2O_2$  in the wound site to prevent  $H_2O_2$ -induced tissue damage. PVAX nanoparticles could effectively control the level of  $H_2O_2$  and accelerate wound healing process *in vitro* and in excisional wound model.

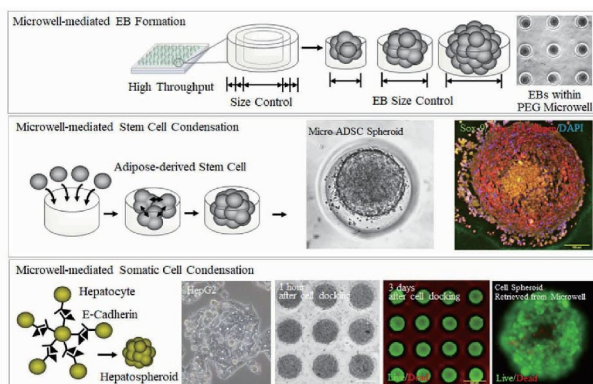
## REVIEW

### Microwell-Mediated Cell Spheroid Formation and Its Applications

Yu-Shik Hwang, Jinseok Kim, Hee Jeong Yoon, Ji In Kang, Ki-Ho Park, and Hojae Bae\*

Macromol. Res., 26, 1 (2018)

Microwell-mediated culture system has become a robust and efficient tool to recapitulate the cell spheroid formation *in vitro*. In this review, we emphasize the recent developments and innovations in microwell-mediated cell culture platform and then recent advancements in applications of cell spheroids generated from microwell-mediated culture system is covered along with the discussion on the integrative biology regarding cell to cell interaction and other biological events in cell spheroid.



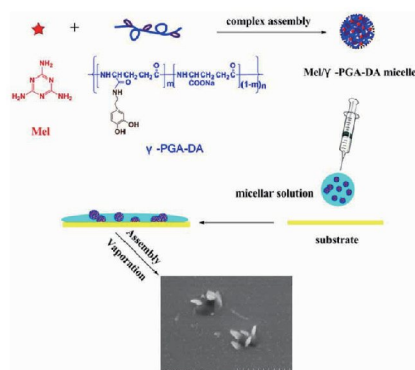
## COMMUNICATION

### Lotus-Like Nano-Architectures Constructed from Self-Assembled Micelles via Hierarchical Assembly

Rongli Zhang\*, Xiaoxia Fan, Xiaofang Xu, Jingjing Lv, Zhenzhen Jin, Hui Hao, and Cuige Zhang\*

*Macromol. Res.*, **26**, 9 (2018)

Dopamine modified  $\gamma$ -polyglutamic acid ( $\gamma$ -PGA-DA) copolymer and melamine (Mel) can self-assemble into Mel/ $\gamma$ -PGA-DA micelles via weak intermolecular interactions in aqueous solution containing small amount of methanol. When Mel/ $\gamma$ -PGA-DA micellar solution was cast on the surface of formvar stabilized with carbon support films, the lotus-like nano-architectures were formed on the surface of substrate via hierarchical assembly of micelles. The size of lotus-like nano-architectures was approximately  $200 \text{ nm} \times 500 \text{ nm}$ .



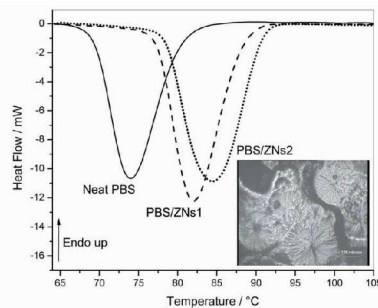
## ARTICLES

### Nonisothermal Crystallization Behavior of Poly(butylene succinate)/NaY Zeolite Nanocomposites

Nicolas Bosq and Duangdao Aht-Ong\*

*Macromol. Res.*, **26**, 13 (2018)

Crystallization of PBS is strongly influenced by the presence of nanozeolites. The good dispersion of those zeolites into the polymer matrix allows to induce a nucleating effect by shifting the crystallization peaks to higher temperatures. A variation of the crystals size is also observed according to the amount of zeolite inserted. Additionally, crystallization mechanisms appears to be modified in the presence of this filler.

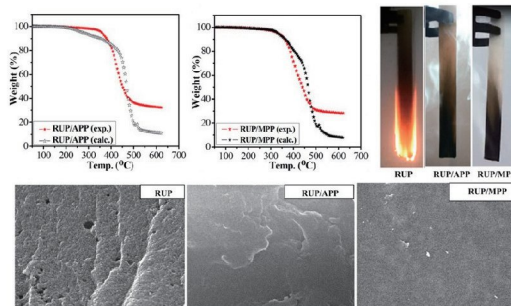


### Effect of Ammonium Polyphosphate and Melamine Pyrophosphate on Fire Behavior and Thermal Stability of Unsaturated Polyester Synthesized from Poly(ethylene terephthalate) Waste

ThuHien Nguyen, DongQuy Hoang\*, and Jinhwan Kim\*

*Macromol. Res.*, **26**, 22 (2018)

The fire behavior and thermal stability of unsaturated polyester derived from recycled poly(ethylene terephthalate) (RUP) in the presence of two phosphorus-nitrogen flame retardants (FRs) including ammonium polyphosphate (APP) and melamine pyrophosphate (MPP) have been investigated. APP and MPP exhibit good flame-retardant effect on RUP. V-0 ratings are obtained and limiting oxygen index (LOI) values remarkably increase to 35 for addition of APP and 36 in the case of MPP. The incorporation of FR significantly enhances the thermal stability of RUP. The char layers of RUP/APP and RUP/MPP contribute in preventing further decomposition of polymeric matrix, provide a good flame shield for the underlying polymeric substrate during the combustion, and reduce the production of flammable volatiles.

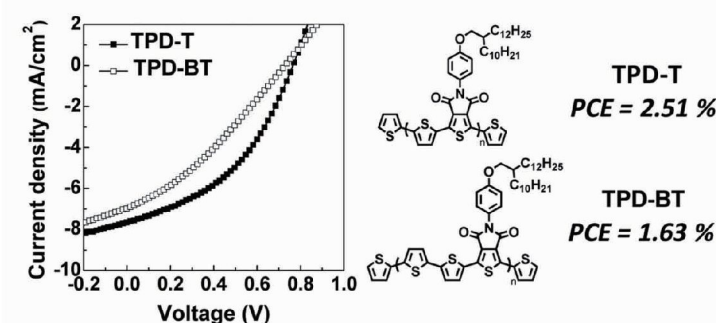


### Synthesis and Characterization of New TPD-based Copolymers and Applications in Bulk Heterojunction Solar Cells

Hyungin Cheon, Yu Jin Kim,  
Moon Chan Hwang, Jisu Hong,  
Tae Kyu An\*, Soon-Ki Kwon\*,  
and Yun-Hi Kim\*

*Macromol. Res.*, **26**, 29 (2018)

We developed and synthesized two novel polymeric semiconductor materials containing thienopyrrolodione (TPD) units, with one of the polymers also containing thiophene (T) units and the other containing bi-thiophene (BT) units, and denoted as TPD-T and TPD-BT, respectively. Polymer solar cells based on TPD-T and TPD-BT were fabricated in a conventional structure. The TPD-T device showed a power conversion efficiency of 2.51%, higher than the 1.63% value of the TPD-BT device, and this difference was attributed to their different nanoscale bulk morphologies and hole mobilities.

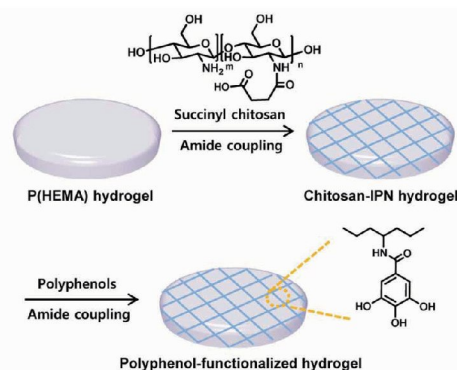


### Polyphenol-Functionalized Hydrogels Using an Interpenetrating Chitosan Network and Investigation of Their Antioxidant Activity

Boram Kim, Byungman Kang,  
Temmy Pegararo Vales,  
Si Kyung Yang\*, Joomin Lee\*,  
and Ho-Joong Kim\*

*Macromol. Res.*, **26**, 35 (2018)

Poly(2-hydroxyethyl methacrylate) (pHEMA)-based hydrogels were first synthesized and subsequently functionalized with an interpenetrating polymer network (IPN) structure comprising cross-linked chitosans and p(HEMA) networks. The resulting hydrogels were further modified with polyphenols such as gallic acid and dopamine through amide coupling reactions to afford the antioxidant hydrogels.



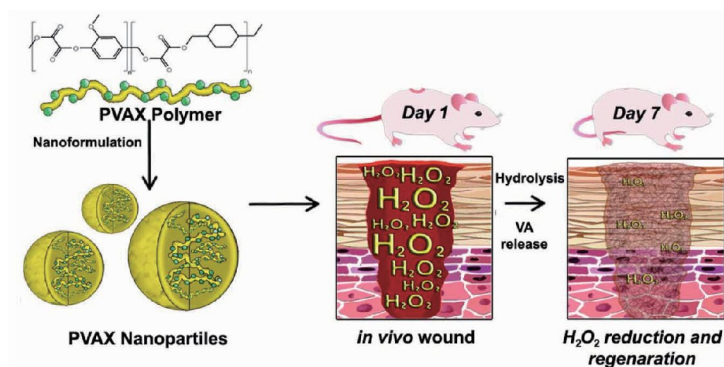
### Hydrogen Peroxide-Responsive Engineered Polyoxalate Nanoparticles for Enhanced Wound Healing

S. V. Berwin Singh, Hyeon Park,  
Gilson Khang, and Dongwon Lee\*

*Macromol. Res.*, **26**, 40 (2018)

#### Cover Paper

The therapeutic activity of  $H_2O_2$ -responsive antioxidant vanillyl alcohol-incorporating polyoxalate (PVAX) nanoparticles was systemically evaluated using a mouse model of excisional wound. PVAX nanoparticles could effectively control the level of  $H_2O_2$  and accelerate wound healing process. PVAX nanoparticles significantly reduced the wound size and induced reepithelization and collagen deposition. We therefore anticipate that PVAX nanoparticles hold great potential as wound healing agents.



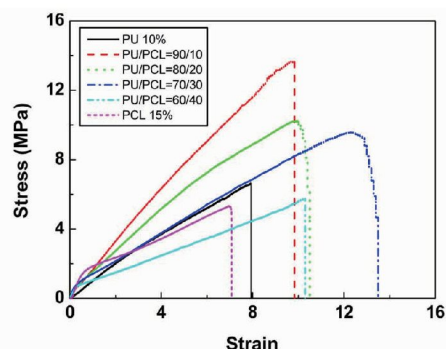


### Synthesis and Characterization of Electrospun PU/PCL Hybrid Scaffolds

Gayeon Oh, Jeongwon Rho,  
Deuk Yong Lee\*, Myung-Hyun Lee,  
and Young-Zu Kim

*Macromol. Res.*, **26**, 48 (2018)

The 10 wt% polyurethane/poly( $\epsilon$ -caprolactone) (PU/PCL) scaffolds having the PCL content in the range of 0 to 40 wt% were electrospun to evaluate the mechanical properties and the biocompatibility of the blended scaffolds. The highest strength of  $12.1 \pm 1.4$  MPa was obtained for the PU/PCL hybrid scaffold possessing 10% PCL. However, the strength of the hybrid scaffolds started to decrease as the PCL content was raised. The PU/PCL blend scaffolds induced no cytotoxicity, suggesting that the scaffolds are adequate to small-diameter vascular grafts.



### Micro-Fibril Cellulose as a Filler for Glass Fiber Reinforced Unsaturated Polyester Composites: Fabrication and Mechanical Characteristics

Cuong Manh Vu\*, Dinh Duc Nguyen\*,  
Le Hoang Sinh, Hyung Jin Choi\*,  
and Tien Duc Pham

*Macromol. Res.*, **26**, 54 (2018)

Bamboo waste was pretreated with alkaline solution prior to kraft pulping to remove silica, hemicellulose, and lignin portions. The bamboo pulp obtained in this manner was dried, directly introduced to unsaturated polyester resin, and further treated by using a grinding method prior to preparing composite materials. Their morphology and mechanical properties were examined.

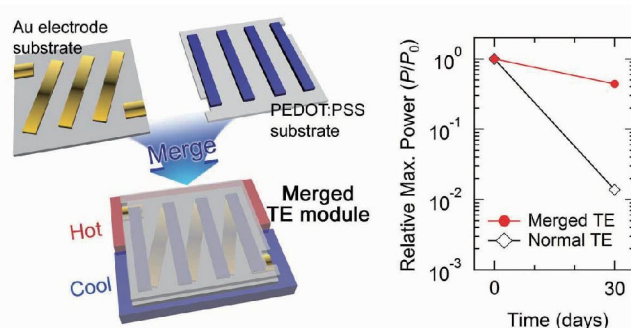


### Simultaneous Improvement of Performance and Stability in PEDOT: PSS-Sorbitol Composite Based Flexible Thermoelectric Modules by Novel Design and Fabrication Process

Jaeyun Kim, Rajkumar Patel,  
Byung Jun Jung,  
and Jeonghun Kwak\*

*Macromol. Res.*, **26**, 61 (2018)

A novel design and fabrication process was introduced for flexible thermoelectric modules by merging two distinct flexible substrates having D-sorbitol blended poly(3,4-ethylenedioxythiophene):poly(styrenesulfonate) (PEDOT:PSS) and Au electrodes for interconnection, respectively. Two substrates merged well owing to the sticky nature of D-sorbitol. They showed enhanced thermoelectric performance and stability by simultaneous thermal annealing and passivation during the suggested merging process.



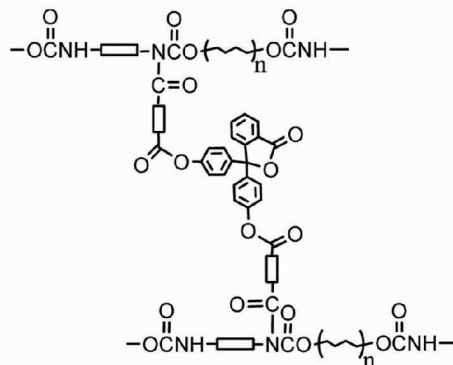


### The Grafting of Phenolphthalein or 4-Tritylaniline onto Polyurethane and the Comparison of Their Effects on Tensile and Shape Recovery Properties and Flexibility at Low Temperature of the Resulting Polymers

Yong-Chan Chung, Jin Cheol Bae,  
Jae Won Choi,  
and Byoung Chul Chun\*

*Macromol. Res.*, **26**, 66 (2018)

Phenolphthalein or 4-tritylaniline was grafted onto polyurethane and the effect of two grafted functional groups was compared. The cross-link density, viscosity, tensile stress, shape recovery, and low temperature flexibility notably improved with the increase of phenolphthalein due to the chemical cross-linking using the grafted phenolphthalein, whereas tritylaniline did not exhibit the similar increase.

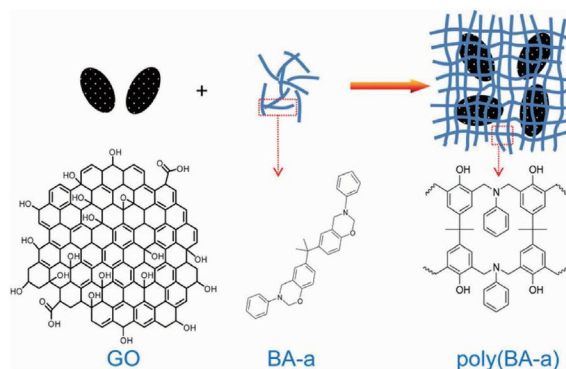


### Effect of Oxygen Functionalities of Graphene Oxide on Polymerization and Thermal Properties of Reactive Benzoxazine Nanocomposites

Wenkai Zhang, Yanshan Zhan,  
Xiuxiu Gao, Runming Li,  
Weiwei Zhu, Hao Xu, Baoying Liu,  
Xiaomin Fang\*, Yuanqing Xu,  
and Tao Ding\*

*Macromol. Res.*, **26**, 77 (2018)

The oxygen functionalities of graphene oxide not only exhibit accelerated effect on the polymerization of the benzoxazine monomer (BA-a), but also interact with the poly(BA-a) matrix. Thermal conductivity of poly(BA-a)/GO composite increases from an initial value of ~0.27 W/mK to 0.47 W/mK as the GO loading increases from 1 wt% to 6 wt% (enhancement factor up to 176%).

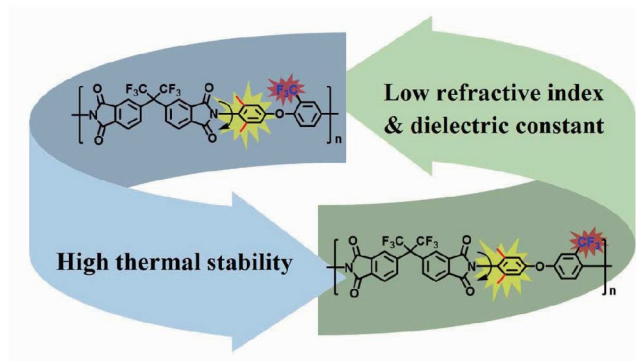


### Highly Soluble Polyimide Based on Asymmetric Diamines Containing Trifluoromethyl Group for High Performance Dielectric Material

Sehwa Bong, Hyeonuk Yeo,  
Bon-Cheol Ku, Munju Goh,  
and Nam-Ho You\*

*Macromol. Res.*, **26**, 85 (2018)

This paper reports the synthesis and characterization of thermally stable aromatic polyimides (APIs) containing trifluoromethyl units in the *ortho* or *meta*-position of the amino groups. The APIs derived from 4-(4-amino-3-(trifluoromethyl)phenoxy)-2,6-dimethylaniline (ARFPA) or 4-(4-amino-2-(trifluoromethyl)phenoxy)-2,6-dimethylaniline (ALFPA) were prepared by polycondensation followed by chemical imidization. The APIs exhibited good thermal properties. The PIs all showed low refractive indices in the range of 1.5470-1.5475 at 637 nm, as well as low dielectric constants.

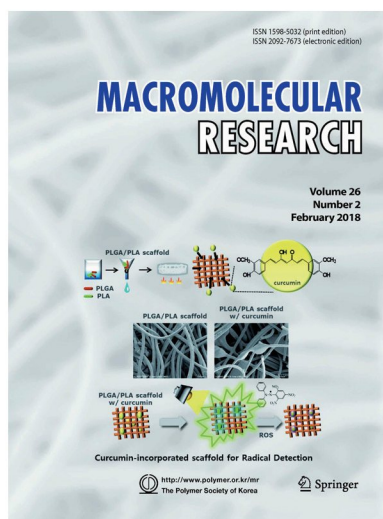


## COVER PAPER

### Curcumin-Incorporated Polymeric Scaffolds and Their Potential for the Detection of Radical Molecules

Ok Park, Chae Hwa Kim, Yoon Jin Kim, Hee Sun Jung, Tae Hee Kim\*, and Hyejung Mok\*

Vol. 26, No. 2, pp 145-150 (2018) | FEB 25, 2018 | DOI 10.1007/s13233-018-6025-0



Reactive oxygen species (ROS)-responsive curcumin was successfully incorporated into poly(lactic-co-glycolic) acid (PLGA)/poly (lactic acid) (PLA) scaffolds *via* noncovalent hydrophobic interaction. Curcumin-incorporated PLGA/PLA scaffolds showed strong fluorescence intensities in PBS solution for 3 days. These fluorescence signals were significantly decreased by the radical molecules. Therefore, this radical-derived oxidation of curcumin in scaffolds could be applied to ROS detection and ROS-related disease monitoring of conditions such as wounds and inflammation.

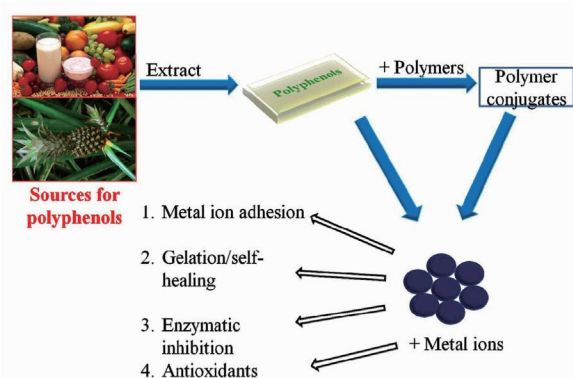
## REVIEW

### Applications Using the Metal Affinity of Polyphenols with Mussel-Inspired Chemistry

Kantappa Halake, Seungvin Cho, Junseok Kim, Taewon Lee, Yunho Cho, Sangwon Chi, Minjoon Park, Kiho Kim, Duckhee Lee, Hyun Ju, Yongha Choi, Myoungsu Jang, GyuHyeong Choe, and Jonghwi Lee\*

*Macromol. Res.*, **26**, 93 (2018)

Polyphenols with mussel-inspired chemistry have become an intense research focus in recent decades. This paper addresses recent applications using the metal-driven coordination of natural flavonoids (polyphenols) in a systematic manner, which leads to enhancements in adhesion, crosslinking, self-healing, and other interesting properties.



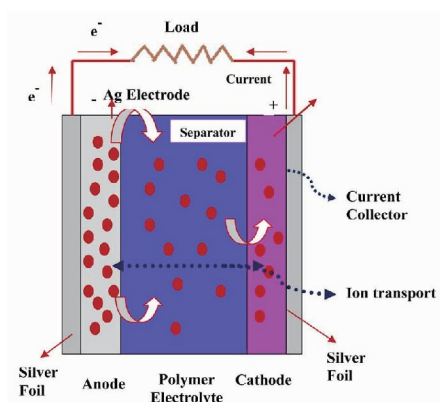
## ARTICLES

### Effect of Alumina Nanofiller and Diphenyl Phthalate Plasticizer on a Silver Ion Conducting Polyethylene Oxide Based Nanocomposite Solid Polymer Electrolyte

Maria Singaraj Johnsi\*  
and Samuel Austin Suthanthiraraj

*Macromol. Res.*, **26**, 100 (2018)

A novel silver ion conducting thin film nanocomposite solid polymer electrolyte (NSPE) has been prepared by blending poly(ethylene oxide) (PEO) as a polymer host with silver trifluoromethane sulfonate ( $\text{AgCF}_3\text{SO}_3$ ) as a dopant ionic salt, aluminum oxide ( $\text{Al}_2\text{O}_3$ ) as an inorganic nanofiller, and diphenyl phthalate (DPP) as a plasticizer using classical solvent casting technique and characterized by means of X-ray diffraction (XRD), electrical conductivity studies, field emission scanning electron microscopic (FESEM) and energy dispersive X-ray (EDX) analyses. Electrochemical cells have been fabricated and their discharge characteristics under dead load and at a constant load of 1 M $\Omega$  have been studied at ambient temperature (298 K).

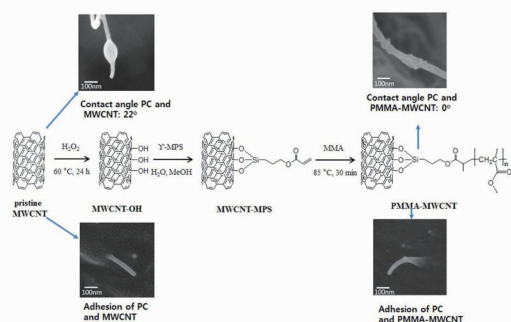


### Characteristics of Polycarbonate Composites with Poly(methyl methacrylate) Grafted Multi-Walled Carbon Nanotubes

Eun Yeob Choi, Jeong Ung Nam,  
So Hyun Hong, and Chang Keun Kim\*

*Macromol. Res.*, **26**, 107 (2018)

The composite of polycarbonate and multi-walled carbon nanotubes (MWCNT) with the strongest interfacial adhesion among similar composites was developed by using MWCNT grafted with poly(methyl methacrylate).

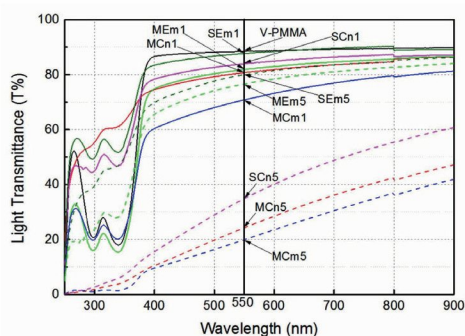


### Effect of Silica Nanotube Surface Modification on the Physical Properties of Nanocomposites with Poly(methyl methacrylate)

Kwang-Yong Na, Jeong-Min Lee,  
Sang-Cheol Han, Yang-Il Huh,  
and Jeong-Cheol Kim\*

*Macromol. Res.*, **26**, 113 (2018)

Poly(methyl methacrylate) (PMMA)/silica nanotube (SNT) composites were prepared with different volume fractions of SNT to compare their mechanical properties and light transmittance. The effect of surface modification on SNT and SNT template removing methods were studied on SNT dispersion in PMMA and on mechanical properties of nanocomposites. The flexural modulus could be improved by about 50% compared to virgin PMMA sheet. Light transmittance could be reached 80% which was close to that of virgin PMMA (88%).



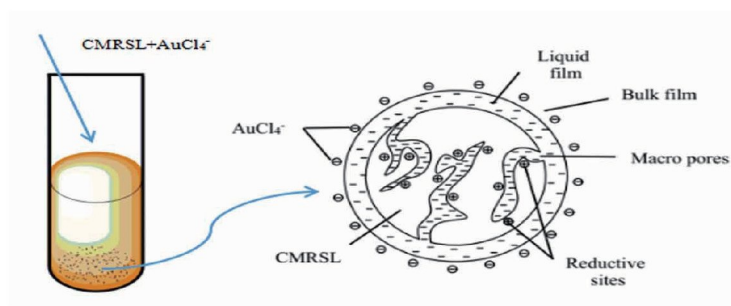


# Adsorption of $\text{AuCl}_4^-$ from Acidic Chloride Solution by Chemically Modified Lignin Based on Rice Straw

Baoping Zhang, Yun Liu\*,  
Zhongchen Ma, Meichen Guo,  
and Bowen Shen

*Macromol. Res.*, **26**, 121 (2018)

When the hydrochloric acid concentration was  $0.5 \text{ mol}\cdot\text{L}^{-1}$ , the adsorption ratio of  $\text{AuCl}_4^-$  was as high as 98.12%, however, the adsorption ratios of  $\text{Ni}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$ , and  $\text{Fe}^{3+}$  were 3.66%, 0.87%, 2.52%, and 0.97%, respectively. When the hydrochloric acid concentration was  $5.0 \text{ mol}\cdot\text{L}^{-1}$ , the adsorption ratio of  $\text{AuCl}_4^-$  was only 29.31% while the adsorption ratios of  $\text{Ni}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$ , and  $\text{Fe}^{3+}$  raised to 12.31%, 4.88%, 10.99%, and 9.40%, respectively. It is meaning that the low hydrochloric acid concentration promoted the selectivity of  $\text{AuCl}_4^-$  and the adsorption rate went up to 98% when the concentration of hydrochloric acid was  $0.5 \text{ mol}\cdot\text{L}^{-1}$ .

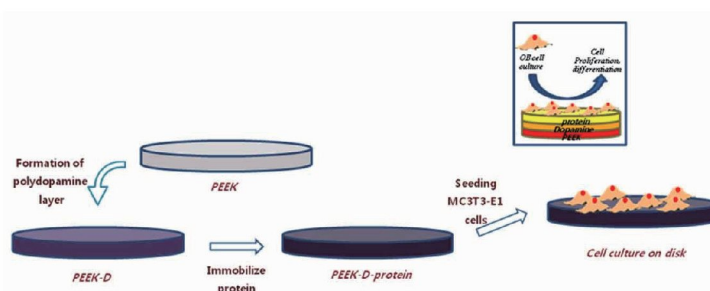


# Enhanced Tissue Compatibility of Polyetheretherketone Disks by Dopamine-Mediated Protein Immobilization

Giwan Kwon, Hun Kim,  
Kailash Chandra Gupta,  
and Inn-Kyu Kang\*

*Macromol. Res.*, **26**, 128 (2018)

Bioactivity of the polyetheretherketone (PEEK) disks has been improved by covalent binding of collagen on polydopamine-coated PEEK surfaces. The polydopamine layer helped in uniform deposition of collagen and the collagen-immobilized PEEK enhanced the adhesion, proliferation and differentiation of MC3T3-E1 cells.

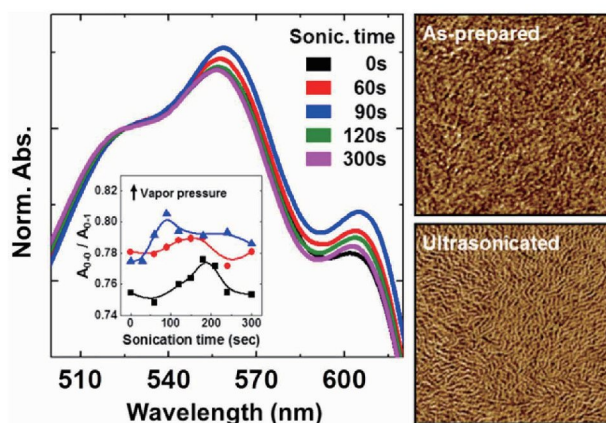


# Ultrasonication-Mediated Self-Assembly in Polythiophene Films via Control of Residual Solvent Evaporation

Hye Su Kim, Junyoung Mun,  
Wi Hyung Lee\*,  
and Yeong Don Park\*

*Macromol. Res.*, **26**, 139 (2018)

We present a systematic study of a simple and fast post-treatment method for controlling the structural order of as-spun polymer films by directly exposing them to ultrasonication. Ultrasonication of polymer chains for a short period of time under solvent vapor pressure was found to increase their mobility, and thus facilitate reorganization. As a result of the improved molecular order, the charge carrier characteristics of the associated field-effect transistors are significantly enhanced.



### Curcumin-Incorporated Polymeric Scaffolds and Their Potential for the Detection of Radical Molecules

Ok Park, Chae Hwa Kim,  
Yoon Jin Kim, Hee Sun Jung,  
Tae Hee Kim\*, and Hyejung Mok\*

*Macromol. Res.*, **26**, 145 (2018)

Cover Paper

In this study, curcumin-incorporated polymeric scaffolds were prepared, and their potential for the rapid detection of radical molecules as a wound stage marker was examined. This radical-derived oxidation of curcumin in scaffolds provided significant reduction of fluorescence signals for reactive oxygen species (ROS) detection.

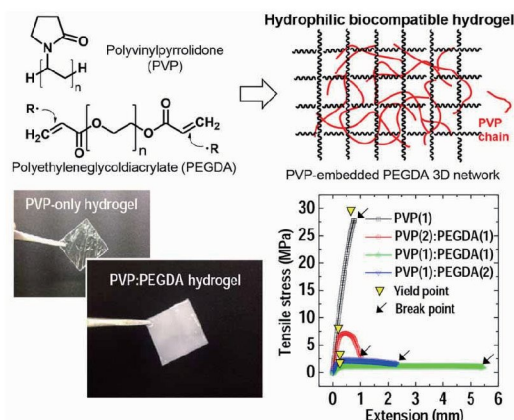


### Thermally Crosslinked Biocompatible Hydrophilic Polyvinylpyrrolidone Coatings on Polypropylene with Enhanced Mechanical and Adhesion Properties

Hayeong Jang, Hyungjoon Choi,  
Heejeong Jeong, Seolhee Baek,  
Singu Han, Dong June Chung\*,  
and Hwa Sung Lee\*

*Macromol. Res.*, **26**, 151 (2018)

We developed a stable hydrophilic biocompatible hydrogel-forming films coated on inert polypropylene (PP) surface. To achieve the goals, we used polyvinyl pyrrolidone (PVP) combined with a crosslinked poly(ethylene glycol)acrylate (PEGDA) hydrogel-forming matrix. The PVP:PEGDA polymer developed showed the superior tensile strain at the break point, adhesion strength to the PP, and water stability. This is potentially useful for improving the merchantability of a variety of consumable PP medical applications.

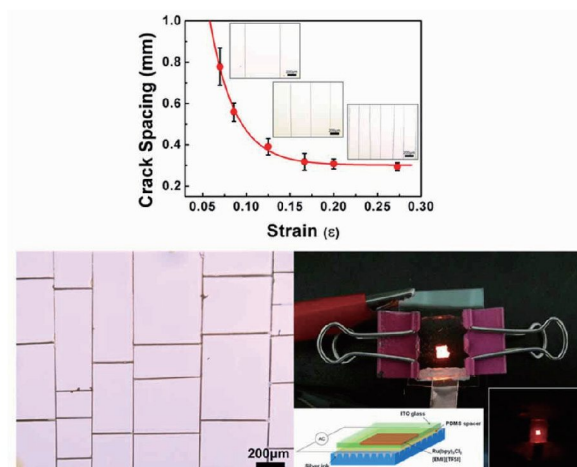


### Fabrication of Grid-Type Transparent Conducting Electrodes Based on Controlled Mechanical Fracture

Jeong Hui Lee, Bonghoon Chung,  
SeongHo Park, Hong Chul Moon\*,  
and Dong Hyun Lee\*

*Macromol. Res.*, **26**, 157 (2018)

A new approach to fabricate flexible transparent conducting electrodes (TCEs) based on controlled crack patterning is developed for an electrochemiluminescent (ECL) device.

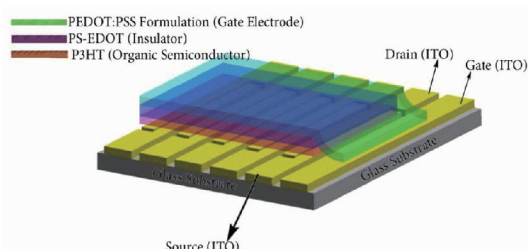


# **The Preparation of Transparent Organic Field Effect Transistor Using a Novel EDOT Functional Styrene Copolymer Insulator with a PEDOT:PSS Gate Electrode**

Okan Gunaydin\*, Ahmet Demir, Gülçin Ersöz Demir, İbrahim Yücedağ, and Bünyemin Çoşut

*Macromol. Res.*, **26**, 164 (2018)

The focus point of this work is to obtain a transparent OFET and to minimize the interface states between gate insulator and gate electrode. Firstly, we have synthesized EDOT functional polystyrene (PS-EDOT) copolymer as gate insulator *via* “click” chemistry between azide-functional styrene copolymer and propargyl-functionalized EDOT. We used the poly(3,4-ethylenedioxythiophene): poly(styrenesulfonate) (PEDOT: PSS) conductive polymer mixture as a suitable alternative gate electrode instead of inorganic contacts, which is a new topic in the organic electronics. The contact resistance value was measured as  $1/600 \text{ (S/cm)}^{-1}$ . At the end of the process transparent OFETs with different channel length were fabricated using spin coating method by which poly(3-hexylthiophene) (P3HT), novel PS-EDOT copolymer insulator and PEDOT:PSS were coated on prepatterned OFET substrate. Electrical characterizations of OFET devices were held in total darkness and in air ambient in order to achieve output and transfer current-voltage ( $I$ - $V$ ) characteristics. The main parameters such as the threshold voltage ( $V_{Th}$ ), field effect mobility ( $\mu_{FET}$ ) and current on/off ratio ( $I_{on/off}$ ) of the devices were extracted from capacitance-frequency ( $C$ - $f$ ) plot. It was found that fabricated PS-EDOT OFETs exhibit good device performances such as low  $V_{Th}$ , remarkable mobility, and  $I_{on/off}$  values.

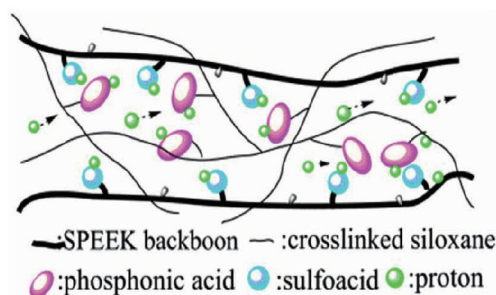


# **Proton Exchange Membrane with Enlarged Operating Temperature by Incorporating Phosphonic Acid Functionalized and Crosslinked Siloxane in Sulfonated Poly(ether ether ketone) (SPEEK) Matrix**

Xuechao Ren, Chunhui Shen\*, Shanjun Gao, Yuan Yuan, and Jiqin Chen

*Macromol. Res.*, **26**, 173 (2018)

Proton exchange membrane with broadened temperature range (25-140 °C) for membrane application was prepared. Better water retention with favorable resistance to swelling was obtained. The crosslinked network endows prominent thermal and mechanical properties. The membrane shares satisfied proton conductivity and single cell performance. The leakage of phosphonic acid is resolved.

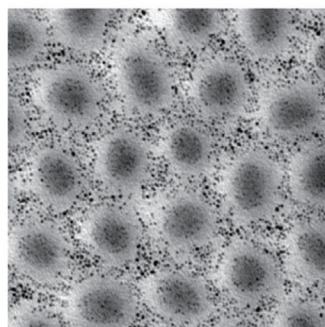


# **Concomitant Organization of Fluorescent Dyes and Au Nanoparticles in Spin-Coated Films of Diblock Copolymer Micelles**

Ki-Se Kim, Sukwoo Jang, Seong Il Yoo\*, and Byeong-Hyeok Sohn\*

*Macromol. Res.*, **26**, 182 (2018)

A single-layered film of polystyrene (PS)-poly(4-vinyl pyridine) (P4VP) micelles was utilized to concomitantly organize Au nanoparticles and fluorescent dyes in separate locations. In the assembled structure, the distance between dyes and nanoparticles was engineered by the size of micelles to study distance-dependent plasmonic effects of nanoparticles on dye fluorescence.



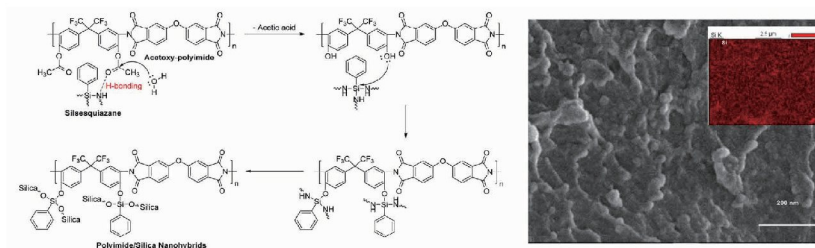


### Homogeneous Polyimide/Silica Nanohybrid Films Adapting Simple Polymer Blending Process: Polymeric Silsesquiazane Precursor to Inorganic Silica

Tae-Hwan Huh, So Yoon Lee,  
Seung Koo Park, Jin-Hae Chang,  
Yunsang Lee, and Young-Je Kwark\*

*Macromol. Res.*, **26**, 187 (2018)

Polyimide (PI)/silica nanohybrids were prepared using silsesquiazane (SSQZ) as a silica precursor. The thermal treatment of the solution blended polymer/SSQZ induced conversion of SSQZ to silica, resulting homogeneous organic-inorganic nanohybrid films due to the covalent bonding between the two components. The resulting PI/silica nanohybrid films showed improved thermal, mechanical, and optical properties.

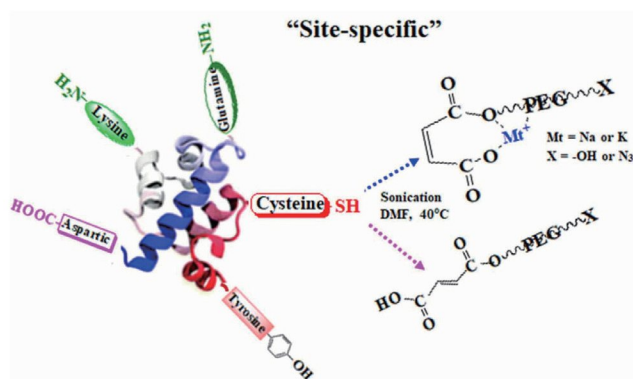


### Michael Addition of Thiol Compounds on $\omega$ -Maleate Poly(ethylene oxide)s: Model Study for the "Site-Specific" Modification of Proteins

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Two types of  $\omega$ -maleate poly(ethylene oxide)s (PEOs) such as  $\alpha$ -azido- $\omega$ -maleate and  $\alpha$ -*t*-butoxy- $\omega$ -maleate PEOs were obtained from the chain end functionalization of 'living' polymeric alkoxides using maleic anhydride as a terminating agent. The maleate end group on the PEO frameworks appeared to be efficient for the "site-specific" PEGylation of proteins through the model study for the Michael reaction of the thiol group under mild condition such as sonication.



### Nucleic Acid-Binding Fluorochromes and Nanoparticles: Structural Aspects of Binding Affinity and Fluorescence Intensity

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The effect of multivalency on the maximum fluorescence intensity is evaluated. A greater number of positive charges results in higher binding affinity to DNA. Flexible asymmetric fluorochromes exhibit intense fluorescence upon binding to DNA. The fluorescence intensity is dependent on the distance between the monovalent sites.

