

2008 추계학술대회 연구논문 초록집

제33권 2호

The Polymer Society
of Korea



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장소 : 일산 KINTEX



한국고분자학회
The Polymer Society of Korea

12:00 **2L5-3** (좌장: 백상현)
Wide-ranging pretilt control of nematic liquid crystal driven by anchoring competition
김재훈 · 이유진 · 광진석
한양대학교 · 한양대학교 정보디스플레이공학과
**한양대학교 디스플레이공학연구소

12:30 **2L5-4**
Fabrication of Micro to Nanolithography Using Highly Periodic Smectic Liquid Crystal Defects
정희태 · 김윤호 · 윤동기 · 정현수
KAIST · 삼성전자 반도체 총괄

액정/LCD 재료(III)/고분자합성

14:00 **2P5-1** (좌장: 이종찬)
Behavior of nematic liquid crystal on soft polymer
광진석 · 이유진 · 김재훈
한양대학교 디스플레이공학연구소
*한양대학교 정보디스플레이공학과
**한양대학교 전자통신컴퓨터공학부

14:20 **2P5-2**
Stepped ribbon structure from Oligo(p-phenylene) Rods with Lateral dendritic chains
홍동제 · 이병수
연세대학교 화학과

14:40 **2P5-3** (좌장: 홍성철)
Size and Shape Controlled Synthesis of Gold Nanoparticles using Poly(1H,1H-dihydroperfluorooctyl methacrylate-*b*-ethylene oxide) Block Copolymers
이민영 · 임권택 · 김상재
부경대학교

15:00 **2P5-4**
Solubilization and Polymer Analogous Reactions of Poly(epichlorohydrin) in Ionic Liquids.
김병각 · 이종찬 · 광승엽 · 손은호 · 정재승
서울대학교

15:20 **2P5-5**
Preparation and Properties of Ultra High Molecular Weight Polyethylene : Effect of Cocatalyst
장희신 · 신영준 · 이호영 · 이동호
경북대학교 · 대한유화

15:40 **2P5-6**
Propylene and Ethylene Polymerization Initiated with Mg-Supported Ti Catalysts : Effects of Internal Donor
신영준 · 이동호 · 하현수 · 강갑구
*대한유화공업(주) · **경북대학교 고분자공학과

제6회장 [10월 10일 (금)]

고분자구조 및 물성(II)

11:00 **2L6-1** (좌장: 하창식)
Gas Pressure effect on Phase Behavior of Polystyrene-*block*- Poly(*n*-pentyl methacrylate) copolymer
김진근 · 김혜정 · 김승빈
포항공과대학교 화학공학과
*포항공과대학교 화학과

11:30 **2L6-2**
Reactivity of terthiophene monomers understood using computational chemistry and spectroscopy.
K. C. Gordon · D. L. Officer
T. M. Clarke · D. K. Grant
Department of Chemistry,
University of Otago, New Zealand
*Massey University, New Zealand

12:00 **2P6-1** (좌장: 방준하)
Hierarchical Assembly of Nanoparticle Superstructures from Block Copolymer-Nanoparticle Composites
강희만 · François A. Detcheverry
Andrew N. Mangham · Robert J. Hamers
Juan J. de Pablo · Paul F. Nealey
University of Wisconsin-Madison

12:20 **2P6-2**
Electrochemical characterization of polyelectrolyte brush
최은영 · Wilhelm T. S. Huck
한국과학기술원
*Department of Chemistry,
University of Cambridge

바이오센서

14:00 **2L6-3** (좌장: 신재섭)
Biosensor Based on the Selective Aggregation of Gold Nanoparticles
이강택 · 이윤희 · 김태훈 · 이소영 · 주상우
연세대학교 화공생명공학부
*서울대학교 수의학과 약리학교실
**충실대학교 화학과

14:30 **2L6-4**
Biosensors Based on Conducting Polymer Nanotubes Conjugated with Versatile Receptors
장정식
서울대학교

15:00 **2L6-5**
고분자막 습도센서의 제조방법 및 특성평가
공명선
단국대학교 화학과

15:30 **2L6-6**
Biomimetic TiO₂ gel ultrathin Film Sensor
양도현 · 오미혜 · 윤여성 · 신재섭
Seung-Woo Lee · Toyoki Kunitake
자동차부품연구원 · 충북대학교
*The University of Kitakyushu

제7회장 [10월 10일 (금)]

최신 플라스틱 소재와 성형가공 기술

9:30 **2L7-1** (좌장: 류민영)
환경 친화성 In-mold coloring 재료 개발
황진택
(주)이폴리머

10:20 **2L7-2**
LCD BLU (Back Light Unit)용 플라스틱 재료와 가공기술 동향
강성욱 · 이연석
LG화학 테크센터 응용기술팀

11:10 **2L7-3**
폴리프로필렌 복합재료를 이용한 자동차 전선용 절연재료의 개발
장도훈
LS전선 중앙연구소

13:00 **2L7-4** (좌장: 황진택)
The Industrial Applications of Carbon Nanotube and Polymer/ CNT Composites
이영실
제일모직 케미칼 연구소

13:50 **2L7-5**
고품질 외관 사출성형 가공기술 [Multi-Material Molding]
오관식
제일모직 TMC사업부 기술지원팀

14:40 **2L7-6**
다수배기 사출성형에서 캐비티간 충전편차 고찰 및 편차 해소를 위한 방법
류민영 · 강민아
서울산업대학교

15:40 **2L7-7** (좌장: 정현욱)
광학 플라스틱 부품 특성평가를 위한 사출성형 해석기술
박근
서울산업대학교 기계설계 자동화공학부

16:30 **2L7-8**
O/A 기기의 금속부품 대체를 위한 엔지니어링 플라스틱의 CAE 해석 및 사출성형
구명술 · 김도
(주)삼양사 화성연구소

이론을 통해 해석하고 분석한 후 응용의 방향성과 응용의 가능성을 제시한다.

정희태 2L5-4
Fabrication of Micro to Nanolithography Using Highly Periodic Smectic Liquid Crystal Defects

정희태¹, 김윤호, 윤동기¹, 정현수 KAIST, ¹삼성전자 반도체 총괄
 The formation of perfect long-range order by soft building blocks is one of the most exciting interdisciplinary research areas in current materials science and nano-biotechnology. Here, we show perfect surface ordering of toric focal conic domains

(TFCDs) with feature size of submicrometer over millimeter-scale area, which can be formed by smectic liquid crystals and a successful route for suitable surface treatment. The highly regular liquid crystal defect domains are several micrometers apart, with nanometer dimple structures in the center of domain and hexagonally ordered with a single structure through large area. The domain patterns are molded by UV-curable polymers and transferred directly to another substrate by using micro contact printing technique. This method has significant advantages over existing approaches to lithographic applications that this is easy to fabricate, generate long-range surface ordering with millimeter-scale, need very short time to form periodic arrays.

액정/LCD 재료(III)/고분자합성 (제 5 회장 [10 월 10 일(금)])

곽진석 2P5-1

Behavior of nematic liquid crystal on soft polymer
 곽진석, 이유진¹, 김재훈^{2,1} *한양대학교 디스플레이공학연구소, ¹한양대학교 정보디스플레이공학과, ²한양대학교 전자통신컴퓨터공학부*

약한 배향력을 가진 표면경계에서 액정의 특이한 성질은 액정의 새로운 응용과 관련하여 많은 관심이 되고 있다. 특히 소프트 폴리머의 표면과 액정 사이의 약한 상호작용에 대한 물리적인 연구는 새로운 액정디바이스 개발을 위한 가장 기초적이고 핵심적인 지식을 제공할 것으로 기대한다. 이 초록에서는 하나의 소프트 폴리머로써, Poly-Methylmethacrylate (PMMA, $T_g=110\text{ }^\circ\text{C}$, Sigma Aldrich)과 일차원 전극을 사용하여 다양한 온도 조건에서 수평전기장을 인가하여 표면 액정방향을 제어하는 방법을 조건적으로 제시하며, 또한 PMMA 표면에서 액정방향자들의 동적 재배열 특성과 완화특성에 대한 실험결과를 바탕으로 물리적, 이론적 고찰을 시도하여 실험결과를 분석한 후 향후 소프트 폴리머 표면에서 액정의 거동현상에 대한 응용 방향성과 가능성을 제공하고 응용성을 향상시키기 위해 요구되어지는 소프트 폴리머의 물리, 화학적 특성을 제시한다.

홍동제 2P5-2
Stepped ribbon structure from Oligo(p-phenylene) Rods with Lateral dendritic chains

홍동제, 이명수¹ *연세대학교 화학과*

Rod-coil systems consisting of rigid rod and flexible coil segments are excellent candidates for creating well defined supramolecular structures via a process of spontaneous organization. Recently, we have synthesized the laterally tethered rod-coil molecules, based on oligo(ethylene oxide) dendrons, with variation in the volume ratio of dendrons. The laterally tethered molecule based on flexible segment was observed to self-assemble into a stepped ribbon oblique columnar structure in a solid state and well-defined nanofiber in a aqueous solution, also exhibited dispersed nematic gel on 2wt% of aqueous solution. These results demonstrate that rational design of a self-assembling molecule based on a laterally tethered rod building block allows stable nanostructures to be produced in solid state and solution state. These nanostructures potentially have a number of applications, including the nanoconductor.

이민영 2P5-3

Size and Shape Controlled Synthesis of Gold Nanoparticles using Poly(1H,1H-dihydroperfluorooctyl methacrylate-*b*-ethylene oxide) Block Copolymers

이민영, 임권택¹, 김상재 *부경대학교*

Well-defined diblock copolymers consisting of a hydrophilic poly(ethylene oxide) (PEO) and hydrophobic poly(1H,1H-dihydroperfluorooctyl methacrylate) (PFOMA) block were utilized to the self-assembly of gold nanoparticles. Gold nanoparticles were prepared through LiAuCl4 autoreduction in the microphase separated morphology of poly(FOMA10k-*b*-EO10 k) block copolymer from chloroform solution at ambient temperature. The particle size and shape were controlled by the block copolymer concentration and PEO block lengths. Our findings indicate that longer PEO blocks lead to an increase in particle size because of an increase in reduction site. An increase in the LiAuCl4 concentration causes a change in the particle shape from spherical to tetragonal or multi-pods nanoplates with increased size.

김병각 2P5-4

Solubilization and Polymer Analogous Reactions of Poly(epichlorohydrin) in Ionic Liquids

김병각, 이종찬¹, 박승엽, 손은호, 정재승 *서울대학교*

In the last decade, there has been increasing interest in using ionic liquid (IL) as solvents for chemical reactions. The interest is stimulated not only by their non-volatility but also by their special properties such as reactivity and selectivity. In the polymer chemistry fields, it is not easy to use the ILs because the polymer doesn't dissolve in ILs. Recently, we investigated the solubility of functional polymers in ILs. Interestingly, polymers bearing oxyethylene units or hydroxy groups have good solubility in ILs. Based on this result, we could synthesize the various polymers through polymer analogous reactions in ILs. The reactions of polyepichlorohydrin and fluorinated alkanethiols in IL, [bmim][Cl], were the most successful case which could afford higher conversions and better yields than the corresponding reaction using the common organic solvents. These results demonstrate the potential of the IL as an alternative to organic solvents for polymer analogous reactions.

장허신 2P5-5

Preparation and Properties of Ultra High Molecular Weight Polyethylene : Effect of Cocatalyst

장허신, 신영준¹, 이호영¹, 이동호¹ *경북대학교, ¹대한유화*

Ultra High Molecular Weight Polyethylene (UHMWPE) is a linear polyethylene with molecular weights over 1.0×10^6 and is known as high modulus PE or high performance PE. UHMWPE is a polymer with a unique combination of wear resistance and low-friction surface properties and is also characterized by a good corrosion resistance and impact strength. In order to prepare UHMWPE, the polymerization of ethylene was carried out with various Ziegler-Natta catalysts and cocatalyst under mild conditions, and the viscosity average molecular weight of obtained PE was found to range from 1.0×10^6 to 7.5×10^6 . The effects of cocatalyst on the catalyst activity, the melting temperature, crystallinity as well as molecular weight of PE were investigated.

신영준 2P5-6

Propylene and Ethylene Polymerization Initiated with Mg-Supported Ti Catalysts : Effects of Internal Donor

신영준^{1,2}, 이동호^{2,1}, 하현수¹, 강갑구¹ *대한유화공업(주), ²경북대학교 고분자공학과*

The electron donor (Lewis Base) in typical Ziegler-Natta catalyst system is divided into two types: the internal donor (ID) is added in the preparation of catalyst, while the external donor (ED) is used at the polymerization process. These donors exhibit the significant effects on the polymerization behaviors in polyolefin preparation. The Ziegler-Natta catalysts of various IDs exhibited the different polymerization behaviors. Without any ED (dialkoxysilane), the catalyst of aliphatic diester and diether ID gave the reasonable catalyst activity and isotacticity in propylene polymerization. In this presentation, the polymerization behaviors of various catalysts with various IDs for homopolymerization and copolymerization of propylene and ethylene were investigated.

고분자구조 및 물성(II) (제 6 회장 [10 월 10 일(금)])

김신곤 2L6-1

Gas Pressure effect on Phase Behavior of Polystyrene-*block*-Poly(*n*-pentyl methacrylate) copolymer

김신곤¹, 김혜정¹, 김승빈² *포항공과대학교, ¹포항공과대학교 화학공학과, ²포항공과대학교 화학과*

Gas pressure effect on phase transitions of polystyrene-*block*-poly(*n*-pentyl methacrylate) copolymers (PS-*b*-PnPMA) was investigated by Fourier-transformed Infrared spectroscopy, small angle neutron scattering (SANS) and birefringence. Depending

on the applied gas types, the size of closed-loop consisting of both the lower disordered-to-ordered transition (LDOT) and the upper ordered-to-disordered transition (UODT) varied dramatically. The loop size of PS-*b*-PnPMA became bigger with increasing nitrogen gas pressure, whereas it became smaller for helium gas. Thus, nitrogen could not be considered as a true inert gas for PS and PnPMA under high temperatures and moderate pressure range (less than 100 bar), but helium became a true inert gas. These results are explained by the binding energy calculation.