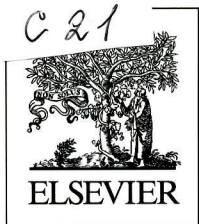


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# Carbohydrate Polymers

SCIENTIFIC AND TECHNOLOGICAL ASPECTS OF  
INDUSTRIALLY IMPORTANT POLYSACCHARIDES

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# Carbohydrate Polymers

## Volume 95, Issue 1, Pages 1-614 (5 June 2013)

### ***PEGylated starch acetate nanoparticles and its potential use for oral insulin delivery***

Original Research Article

Pages 1-8

P.F. Minimol, Willi Paul, Chandra P. Sharma

#### ***Highlights***

► Hydrophilic polyethylene glycol was conjugated with hydrophobic starch acetate. ► Nanoparticles were formed by self aggregation of this polymer conjugate. ► These nanoparticles were highly bioadhesive compared to chitosan. ► These nanoparticles can incorporate insulin and release it in a sustained manner.

### ***The antioxidant activities and neuroprotective effect of polysaccharides from the starfish *Asterias rollestoni****

Original Research Article

Pages 9-15

Wenjing Zhang, Jing Wang, Weihua Jin, Quanbin Zhang

#### ***Highlights***

► A glucan and sulfate mannoglucan were obtained from starfish. ► Glucan displayed neuroprotective activities. ► Sulfated mannoglucan exhibited the antioxidant activities and neuroprotective activity.

### ***Chitosan as matrix for bio-polymer dispersed liquid crystal systems***

Original Research Article

Pages 16-24

Luminita Marin, Maria-Cristina Popescu, Andrei Zabolica, Hiroshi Uji-I, Eduard Fron

#### ***Highlights***

► Polymer dispersed liquid crystal composites based on chitosan polymer matrix were obtained. ► The 4-cyano-4'-pentylbiphenyl liquid crystal droplets have a radial configuration. ► Submicronic droplets were obtained for low content of liquid crystal. ► The micronic dispersion of liquid crystal into chitosan matrix results in a better luminescence.

### ***Improvement of enzyme transport in wood chips for thermomechanical pulp refining***

Original Research Article

Pages 25-31

Andre Pelletier, Kecheng Li, Yu Zhao, George Court, James Luo, Mark Frith

#### ***Highlights***

► An enzyme treatment was used to treat wood chips prior to mechanical refining. ► Treatment of certain substrate sizes was able to reduce refiner energy consumption. ► Reducing sugar production indicated size reduction alone could not help penetration. ► Compression/decompression in the

enzyme solution helped improve penetration. ► A molecular probe coupled to CLSM helped visualize the added penetration.

### ***Chemically and mechanically isolated nanocellulose and their self-assembled structures***

Original Research Article

Pages 32-40

Feng Jiang, You-Lo Hsieh

#### ***Highlights***

► Cellulose nanocrystals and nanofibrils isolated from rice straw yielded up to 20%. ► Isolation by acid hydrolysis, blending and TEMPO oxidation was compared. ► Nanocellulose showed distinctly different sizes and surfaces. ► Nanocellulose had cellulose I $\beta$  crystalline structure with crystallinity up to 91%. ► Nanocellulose self assembled into 153–440 nm fibers upon rapid freezing and drying.

### ***Association states of multisensitive smart polysaccharide–block-polyetheramine copolymers***

Original Research Article

Pages 41-49

Sabrina Belbekhouche, Jacques Desbrières, Thierry Hamaide, Didier Le Cerf, Luc Picton

#### ***Highlights***

► Self-organization in water of block copolymers based on polysaccharide is reported. ► Macroscopic and mesoscopic scale approaches are investigated. ► pH and/or temperature sensitive properties are evidenced. ► Different association states are obtained varying copolymer amphiphilic character.

### ***Two-step method for encapsulation of oregano essential oil in chitosan nanoparticles: Preparation, characterization and in vitro release study***

Original Research Article

Pages 50-56

Seyed Fakhreddin Hosseini, Mojgan Zandi, Masoud Rezaei, Farhid Farahmandghavi

#### ***Highlights***

► Oregano essential oil was encapsulated in chitosan nanoparticles. ► Oil presence in nanoparticles was corroborated by FTIR, TGA and XRD techniques. ► Particles had spherical shape and size range about 40–80 nm. ► The release profile of the OEO showed burst effect followed by slow release.

### ***Effects of dissolution of some lignocellulosic materials with ionic liquids as green solvents on mechanical and physical properties of composite films***

Original Research Article

Pages 57-63

Ali Abdulkhali, Ebrahim Hojati Marvast, Alireza Ashori, Ali Naghi Karimi

#### ***Highlights***

► The present study realized an environmentally friendly method of cleanly extracting cellulose from woody biomass. ► Cellulose can greatly enhance the flexibility of films especially at low lignin contents. ► The treatment with [DiMIM][MeSO<sub>4</sub>] had no obvious effect on the solubility of the used materials. ► The solubilization efficiency of woody materials in ILs was found in an order of CEL > CMP ≥ PW. ► CEL film showed superior physical and mechanical properties compared with PW and CMP films.

## ***Blood compatibility of polyethersulfone membrane by blending a sulfated derivative of chitosan***

Original Research Article

Pages 64-71

Jimin Xue, Weifeng Zhao, Shengqiang Nie, Shudong Sun, Changsheng Zhao

### ***Highlights***

► A new organosoluble sulfated derivative of chitosan was obtained by a simple method. ► The derivative of chitosan can be conveniently used to modify PES membrane. ► The blood compatibility of the modified PES membrane was improved.

## ***Self-assembly of polypyrrole/chitosan composite hydrogels***

Original Research Article

Pages 72-76

Hao Huang, Jiao Wu, Xi Lin, Liang Li, Songmin Shang, Marcus Chun-wah Yuen, Guoping Yan

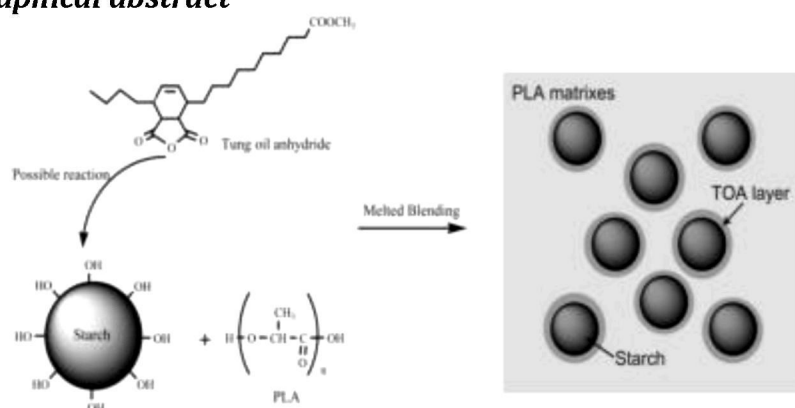
## ***The properties of poly(lactic acid)/starch blends with a functionalized plant oil: Tung oil anhydride***

Original Research Article

Pages 77-84

Zhu Xiong, Chao Li, Songqi Ma, Jianxian Feng, Yong Yang, Ruoyu Zhang, Jin Zhu

### ***Graphical abstract***



### ***Highlights***

► Tung oil anhydride could be used as a bio-based reactive plasticizer for PLA/starch compounds. ► TOA could enrich on starch and increase the compatibility of PLA/starch blends via reaction. ► It has no report about tung oil anhydride influencing the properties of PLA/starch blends.

## ***Preparation of homogeneous grafting cellulose and partial substitution for polyethersulfone membrane material***

Original Research Article

Pages 85-90

Fushan Chen, Zhonghua Sun

### ***Highlights***

► Methyl methacrylate was grafted onto cellulose in DMAc/LiCl successfully. ► The efficient homogeneous grafting conditions in DMAc/LiCl were confirmed. ► The grafting percentage of homogeneous grafted cellulose could reach 76%. ► The cellulose/PES blend ratio should be controlled in about 1:16. ► The grafted cellulose/PES blend membrane was a compatible system.

## ***Structure and mechanical properties of new biomass-based nanocomposite: Castor oil-based polyurethane reinforced with acetylated cellulose nanocrystal***

Original Research Article

Pages 91-99

Song Lin, Jin Huang, Peter R. Chang, Siwen Wei, Yixiang Xu, Qiaoxin Zhang

### ***Highlights***

► Acetylated cellulose nanocrystals resulted in the simultaneous enhancement of strength, modulus and elongation. ► Acetylation of cellulose nanocrystals improved the dispersion stability in blending medium and the miscibility with matrix. ► Castor oil together with acetylated cellulose nanocrystals as reinforcing filler contributed high biomass content.

## ***Thermo-mechanical properties of the composite made of poly (3-hydroxybutyrate-co-3-hydroxyvalerate) and acetylated chitin nanocrystals***

Original Research Article

Pages 100-106

Bingjie Wang, Jun Li, Jianqiang Zhang, Huyan Li, Peng Chen, Qun Gu, Zongbao Wang

### ***Highlights***

► Acetylated modification was used to prepare the hydrophobic acetylated chitin nanocrystals (CN). ► The modified CN maintained the rod-like morphology and crystal structure. ► The hydroxyl groups were partly replaced by the acetyl groups, which reduced the intermolecular hydrogen bonds. ► Acetylated CN assisted the crystallization behavior and reinforced the mechanical properties of PHBV.

## ***The TAED/H<sub>2</sub>O<sub>2</sub>/NaHCO<sub>3</sub> system as an approach to low-temperature and near-neutral pH bleaching of cotton***

Original Research Article

Pages 107-113

Xiaoxia Long, Changhai Xu, Jinmei Du, Shaohai Fu

### ***Highlights***



► The TAED/H<sub>2</sub>O<sub>2</sub>/NaHCO<sub>3</sub> system was conducted for bleaching of cotton. ► The bleaching performance was investigated and optimized using CCD combined with RSM. ► Temperature was the most significant variable followed by [TAED] and time but [NaHCO<sub>3</sub>] was insignificant. ► The bleaching system provided cotton with satisfactory degree of whiteness, water absorbency and dyeability. ► The bleaching system had competitive advantage in protecting cotton from severe chemical damage in bleaching.

### ***Extraction, characterization and biological activities of polysaccharides from Amomum villosum***

Original Research Article

Pages 114-122

Danyan Zhang, Shijie Li, Qingping Xiong, Changxing Jiang, Xiaoping Lai

### ***Non-covalent crosslinkers for electrospun chitosan fibers***

Original Research Article

Pages 123-133

Marjorie A. Kiechel, Caroline L. Schauer

#### ***Highlights***

► GP, TA and TPP were used to non-covalently crosslink electrospun chitosan. ► OS and activated OS crosslinking produces unbranched fibers. ► TS and activated TS crosslinking yield branched/web electrospun chitosan fibers. ► Activation of TS chitosan-TPP and TS chitosan-TA mats are insoluble in water for 72 h. ► TS chitosan-TA electrospun mats are insoluble in 1 M AA for 72 h.

### ***Development and characterization of novel alginate-based hydrogels as vehicles for bone substitutes***

Original Research Article

Pages 134-142

D.S. Morais, M.A. Rodrigues, T.I. Silva, M.A. Lopes, M. Santos, J.D. Santos, C.M. Botelho

### ***Hypoglycemic property of acidic polysaccharide extracted from Saccharina japonica and its potential mechanism***

Original Research Article

Pages 143-147

Jing Wang, Weihua Jin, Wenjing Zhang, Yun Hou, Hong Zhang, Quanbin Zhang

### ***In vitro enzymatic degradation of a biological tissue fixed by alginate dialdehyde***

Original Research Article

Pages 148-154

Yuanting Xu, Chengcheng Huang, Li Li, Xixun Yu, Xu Wang, Hong Peng, Zhipeng Gu, Yaping Wang

### ***Regulation of the thermal sensitivity of hydroxypropyl cellulose by poly(N-isopropylacryamide) side chains***

Original Research Article

Pages 155-160

Xin Jin, Hongliang Kang, Ruigang Liu, Yong Huang

### ***Interrelationship between the zeta potential and viscoelastic properties in coacervates complexes***

Original Research Article

Pages 161-166

Hugo Espinosa-Andrews, Karina Esmeralda Enríquez-Ramírez, Eristeo García-Márquez, Cesar Ramírez-Santiago, Consuelo Lobato-Calleros, Jaime Vernon-Carter

#### ***Highlights***

► Biopolymers ratio impacts the physicochemical and rheological properties of complexes. ► Biopolymers ratio and pH of the dispersion alter the charge density of the complexes. ► The charge density in complex coacervate phases shifts the rheological profile. ► Gum arabic:chitosan complex coacervate phases form a viscous liquid-like dispersion.

### ***Influence of phytic acid and its metal complexes on the activity of pectin degrading polygalacturonase***

Original Research Article

Pages 167-170

Uzma Asghar, Haneef Ur Rehman, Shah Ali Ul Qader, Zahida Tasneem Maqsood

#### ***Highlights***

► Phytic acid significantly inhibits the activity of polygalacturonase. ► The phytate-metallic complexes inhibit the polygalacturonase activity to some extent. ► 70% of polygalacturonase activity was lost after treatment of 20 mM of phytic at 37 °C for 30 min. ► Treatment of fruits and vegetables plants to phytic acid and Al<sup>3+</sup> might be helpful to reduce their spoilage.

### ***Effect of amylopectin on the rheological properties of aqueous dispersions of starch–sodium palmitate complexes***

Original Research Article

Pages 171-176

Jeffrey A. Byars, George F. Fanta, James A. Kenar

#### ***Highlights***

► Helical inclusion complexes were prepared with high amylose and normal corn starch. ► Blends were prepared to vary the amylose:amylopectin ratio. ► Gel strength decreased with increasing amylopectin content. ► Amylopectin was not part of the gel network. ► Temperature dependence of rheological properties depended on amylopectin content.

### ***Hydrophobic derivatives of guar gum hydrolyzate and gum Arabic as matrices for microencapsulation of mint oil***

Original Research Article

Pages 177-182

Shatabhisa Sarkar, Sumit Gupta, Prasad S. Variyar, Arun Sharma, Rekha S. Singhal

### ***Selenylation modification can enhance immune-enhancing activity of***

## ***Chinese angelica polysaccharide***

Original Research Article

Pages 183-187

Tao Qin, Jin Chen, Deyun Wang, Yuanliang Hu, Jing Zhang, Mi Wang, Shulei Qiu, Zhenzhen Gao, Rongrong liu, Yun Yu, Yee Huang, Qiaochu Wang, Qiaoxiu Wang

## ***Iota-Carrageenan-based biodegradable Ag<sup>0</sup> nanocomposite hydrogels for the inactivation of bacteria***

Original Research Article

Pages 188-194

Tippabattini Jayaramudu, Gownolla Malegowd Raghavendra, Kokkarachedu Varaprasad, Rotimi Sadiku, Koduri Ramam, Konduru Mohana Raju

## ***Preliminary structural characterization and antioxidant activities of polysaccharides extracted from Hawk tea (*Litsea coreana* var. *lanuginosa*)***

Original Research Article

Pages 195-199

Xuejing Jia, Lihua Dong, Yong Yang, Shu Yuan, Zhongwei Zhang, Ming Yuan

## ***Antioxidant and immunoregulatory activity of *Ganoderma lucidum* polysaccharide (GLP)***

Original Research Article

Pages 200-206

Min Shi, Zhenya Zhang, Yingnan Yang

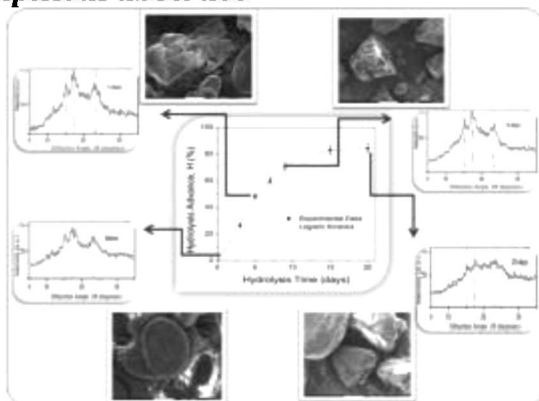
## ***Plantain starch granules morphology, crystallinity, structure transition, and size evolution upon acid hydrolysis***

Original Research Article

Pages 207-213

C. Hernández-Jaimes, L.A. Bello-Pérez, E.J. Vernon-Carter, J. Alvarez-Ramire

### ***Graphical abstract***





## ***Facile synthesis of tunable silver nanostructures for antibacterial application using cellulose nanocrystals***

Original Research Article

Pages 214-219

Rui Xiong, Canhui Lu, Wei Zhang, Zehang Zhou, Xinxing Zhang

## ***Physico-chemical and functional properties of Resistant starch prepared from red kidney beans (*Phaseolus vulgaris*.L) starch by enzymatic method***

Original Research Article

Pages 220-226

Chagam Koteswara Reddy, M. Suriya, Sundaramoorthy Haripriya

### ***Highlights***

► The present study would be a boon to the functional food industry. ► An enzymatic method increases the amylose content followed by formation of resistant starch. ► Resistant starch was resistant to gelatinization decreasing digestibility. ► Thermal characteristics were also increased for functional foods applications.

## ***Effects of amylose chain length and heat treatment on amylose–glycerol monocaprato complex formation***

Original Research Article

Pages 227-232

Xing Zhou, Ren Wang, Yuxian Zhang, Sang-Ho Yoo, Seung-Taik Lim

### ***Highlights***

► The effects of amylose chain-length and heat-treatment on amylose–GMC complex formation were investigated. ► The longer amylose chains facilitated the amylose–GMC complex formation. ► Both type I and type II complexes were formed after the initial DSC heating. ► Only the type II complexes were formed after the prolonged heat treatment with improved crystallinity and thermostability.

## ***Optimization of production yield and functional properties of pectin extracted from sugar beet pulp***

Original Research Article

Pages 233-240

Cheng Lv, Yong Wang, Li-jun Wang, Dong Li, Benu Adhikari

### ***Highlights***

► Extraction process of sugar beet pulp pectin (SBPP) on yield, yield stress and tint has been optimized. ► The yield, color, rheological and emulsifying properties of SBPP were measured. ► The flow behavior of SBPP solution followed the Herschel–Bulkley model. ► RSM was used to quantify the integral effect of extraction temperature, time and pH. ► Optimum yield (24.45%), yield stress and tint value were obtained at 93.7 °C, 3 h and pH value of 1.21.

## ***Innovative thermoplastic chitosan obtained by thermo-mechanical mixing with polyol plasticizers***

Original Research Article

Pages 241-251

Marie Matet, Marie-Claude Heuzey, Eric Pollet, Abdellah Ajji, Luc Avérus

### **Highlights**

► Plasticized chitosan was prepared by thermo-mechanical kneading. ► Glycerol gives the most important amorphous phase content. ► Amorphous phase content increases with polyol quantity. ► Higher mechanical properties were obtained for plasticized chitosan with sorbitol. ► Viscoelastic properties increase with storage time.

## ***Uniquely different PVA-xanthan gum irradiated membranes as transdermal diltiazem delivery device***

Original Research Article

Pages 252-261

Tridib Bhunia, Arindam Giri, Tanbir Nasim, Dipankar Chattopadhyay, Abhijit Bandyopadhyay

### **Highlights**

► Xanthan gum content strongly influenced crystalline PVA morphology on irradiation. ► High molecular weight PVA-low xanthan gum combination produced fibrillar PVA. ► Conversely, low molecular weight PVA-xanthan gum produced fibrillar PVA. ► Fibrillar PVA produced mechanically stronger membrane than lamellar PVA. ► They show most sustained relaxation based transdermal diltiazem release than else.

## ***Fractionation and characterization of hemicelluloses from young bamboo (*Phyllostachys pubescens* Mazel) leaves***

Original Research Article

Pages 262-271

Hong Peng, Mengyang Zhou, Ziping Yu, Jinsheng Zhang, Roger Ruan, Yiqin Wan, Yuhuan Liu

## ***Small strain deformation measurements of konjac glucomannan solutions and the influence of borate cross-linking***

Original Research Article

Pages 272-281

Ian Ratcliffe, Peter A. Williams, Robert J. English, John Meadows

### **Highlights**

► Oscillatory shear vane rheometer test methods were compared for transient 'gels'. ► Konjac glucomannan solutions and borate cross-linked 'gels' were investigated. ► Contributions of connectivity and network dynamics to rheology were assessed. ► Comparison to associating polymer behaviour was made.

## ***A chemically sulfated polysaccharide from *Grifola frondos* induces HepG2 cell apoptosis by notch1-NF- $\kappa$ B pathway***

Original Research Article

Pages 282-287

Chun-ling Wang, Meng Meng, Sheng-bin Liu, Li-rui Wang, Li-hua Hou, Xiao-hong Cao

### **Highlights**

► We demonstrated that S-GFB had lower toxicity and high selectivity. ► We proved that S-GFB prevented the entering nucleus of NF- $\kappa$ B p65 through notch1. ► The underlying intracellular signal of S-GFB induced apoptosis was clarified firstly.

### ***Physicochemical studies of glucose, gellan gum, and hydroxypropyl cellulose—Inhibition of cast iron corrosion***

Original Research Article

Pages 288-294

Velayutham Rajeswari, Devarayan Kesavan, Mayakrishnan Gopiraman, Periasamy Viswanathamurthi

### ***Trimerization of $\beta$ -cyclodextrin through the click reaction***

Pages 295-298

Kranthikumar Tungala, P. Adhikary, S. Krishnamoorthi

### ***Oxygen barrier of multilayer thin films comprised of polysaccharides and clay***

Pages 299-302

Galina Laufer, Christopher Kirkland, Amanda A. Cain, Jaime C. Grunlan

#### ***Highlights***

► Multilayered polysaccharide–clay nanocoatings for food packaging applications. ► Layer-by-layer assembly allows for strategic placement of highly oriented clay platelets. ► Nanobrick wall thin films are less than 60 nm thick and completely transparent. ► Oxygen permeability can be reduced to  $5.7 \times 10^{-17} \text{ cm}^3 \text{ cm/cm}^2 \text{ s Pa}$ .

### ***Ethylenediaminediacetic acid bis(carbido amide chitosan): Synthesis and evaluation as solid carrier to fabricate nanoemulsion***

Original Research Article

Pages 303-314

Kuldeep Singh, A.K. Tiwary, Vikas Rana

#### ***Highlights***

► Ethylenediaminediacetic acid bis(carbido amide chitosan) (ED-chitosan) microparticles were synthesized. ► The ED-chitosan microparticles were characterized using FTIR-ATR, SEM, TEM and DSC analysis. ► We examined microparticles employing OAC, ADC, surface free energy and dynamic advancing contact angle. ► The potential of ED-chitosan microparticles for the fabrication of nanoemulsion was evident.

### ***Effect of starch filler on calcium-alginate hydrogels loaded with yerba mate antioxidants***

Original Research Article

Pages 315-323

Alex López Córdoba, Lorena Deladino, Miriam Martino

***Effect of soluble polysaccharides addition on rheological properties and microstructure of chitin nanocrystal aqueous dispersions***

Original Research Article

Pages 324-331

Maria V. Tzoumaki, Thomas Moschakis, Costas G. Biliaderis

***Improved process for the production of cellulose sulfate using sulfuric acid/ethanol solution***

Original Research Article

Pages 332-337

Guo Chen, Bin Zhang, Jun Zhao, Hongwen Chen

***Aged-look vat dyed cotton with anti-bacterial/anti-fungal properties by treatment with nano clay and enzymes***

Original Research Article

Pages 338-347

Ali Sadeghian Maryan, Majid Montazer, Tina Harifi, Mahnaz Mahmoudi Rad

***Highlights***

► Vat dyed cotton fabric was treated by nano clay along with enzymes. ► The antimicrobial and antifungal effects were successfully achieved. ► The treated cotton had a smooth surface with improved softness and handle properties. ► Low toxicity of the treated sample on human dermal fibroblast was also proved.

***Preparation and characterization of some graphene based nanocomposite materials***

Original Research Article

Pages 348-359

Shabnam Sheshmani, Raheleh Amini

***Synthesis of water-soluble and water-insoluble amphiphilic derivatives of dextran in organic medium***

Original Research Article

Pages 360-365

Rudy Covis, Catherine Ladaviere, Jacques Desbrieres, Emmanuelle Marie, Alain Durand

***Investigation of water-soluble inclusion complex of hypericin with  $\beta$ -cyclodextrin polymer***

Original Research Article

Pages 366-370

Wang Zhang, Xiangdong Gong, Yin Cai, Chuanli Zhang, Xing Yu, Jian Fan, Guowang Diao

### ***Effects of chitosan–glucose complex coating on postharvest quality and shelf life of table grapes***

Original Research Article

Pages 371-378

Pisheng Gao, Zhiqiang Zhu, Ping Zhang

### ***Combined antimicrobial finishing and pigment printing of cotton/polyester blends***

Original Research Article

Pages 379-388

N.A. Ibrahim, T.M. Abou Elmaaty, B.M. Eid, E. Abd El-Aziz

### ***Effect of a glassy gellan/polydextrose matrix on the activity of $\alpha$ -D-glucosidase***

Original Research Article

Pages 389-396

Vinita Chaudhary, Darryl M. Small, Stefan Kasapis

### ***Effects of urea on freeze–thaw stability of starch-based wood adhesive***

Original Research Article

Pages 397-403

Zhenjiong Wang, Zhengbiao Gu, Zhaofeng Li, Yan Hong, Li Cheng

#### ***Highlights***

- Urea can significantly improve the freeze–thaw resistance of starch-based wood adhesive. ► Urea can inhibit retrogradation behavior of starch molecules in starch-based wood adhesive. ► The most optimal dosage of urea is 15% (w/w).

### ***Carbohydrate plasma expanders for passive tumor targeting: In vitro and in vivo studies***

Original Research Article

Pages 404-413

Stefan Hoffmann, Henrike Caysa, Judith Kuntsche, Patrick Kreideweiß, Anja Leimert, Thomas Mueller, Karsten Mäder

### ***Evaluation of cellulose and carboxymethyl cellulose/poly(vinyl alcohol) membranes***

Original Research Article

Pages 414-420

Maha M. Ibrahim, Andreas Koschella, Ghada Kadry, Thomas Heinze

### ***Synthesis and characterization of novel carboxymethylcellulose***

## ***hydrogels and carboxymethylcellulose-hydrogel-ZnO-nanocomposites***

Original Research Article

Pages 421-427

M. Hashem, S. Sharaf, M.M. Abd El-Hady, A. Hebeish

## ***CTMP-based cellulose fibers modified with core-shell latex for reinforcing biocomposites***

Original Research Article

Pages 428-433

Yuanfeng Pan, Huining Xiao, Yi Zhao, Zhuang Wang

## ***Cellulose acetate-zirconium (IV) phosphate nano-composite with enhanced photo-catalytic activity***

Original Research Article

Pages 434-440

Vinod Kumar Gupta, Deepak Pathania, Pardeep Singh, Bhim Singh Rathore, Priyanka Chauhan

### ***Highlights***

► Cellulose acetate Zr (IV) phosphate nanocomposite was synthesized. ► The ion exchange capacity of CA/ZPNC was explored. ► CA/ZPNC was highly selective for lead ions. ► CA/ZPNC proved to be an efficient photocatalyst for dye degradation.

## ***In vitro and in vivo evaluation of curcumin loaded lauroyl sulphated chitosan for enhancing oral bioavailability***

Original Research Article

Pages 441-448

R. Shelma, Chandra P. Sharma

### ***Highlights***

► In spite of curcumin's anticancer properties, it faces low oral bioavailability. ► A carrier for the curcumin to improve its bioavailability was developed. ► We achieved superior pharmacological availability of oral curcumin in vivo.

## ***$\beta$ -Cyclodextrin conjugated magnetic, fluorescent silica core-shell nanoparticles for biomedical applications***

Original Research Article

Pages 449-457

Abu Zayed Md. Badruddoza, Md. Taifur Rahman, Sudipa Ghosh, Md. Zakir Hossain, Jizhong Shi, Kus Hidajat, Mohammad Shahab Uddin

### ***Highlights***

► Synthesis of  $\beta$ -CD conjugated magnetic, fluorescent silica core-shell nanoparticles. ► **Multiple** functionalities: magnetism, fluorescence, cell-targeting and drug delivery. ►  $\beta$ -CD moiety grafted on particle surface can act as a water-insoluble drug carrier. ► Applications in simultaneous bioimaging,



cell-targeting and hydrophobic drug delivery. ► These NPs has shown potentials as a **theranostic** candidate in biomedical fields.

### ***Molecular mobility and microscopic structure changes in $\kappa$ -carrageenan solutions studied by gradient NMR***

Original Research Article

Pages 458-464

Qihua Zhao, Tom Brenner, Shingo Matsukawa

#### ***Highlights***

► We reveal the gelation mechanism in carrageenan solution by using NMR. ► The signal intensity and diffusion coefficients were related to molecular mobility. ► The diffusion of pullulan added as a probe gave information on the gelation mechanism. ► A simple physical model for the change of the microscopic environment was proposed.

### ***High stability of immobilized $\beta$ -D-galactosidase for lactose hydrolysis and galactooligosaccharides synthesis***

Original Research Article

Pages 465-470

Manuela P. Klein, Lucas P. Fallavena, Jéssie da N. Schöffer, Marco A.Z. Ayub, Rafael C. Rodrigues, Jorge L. Ninow, Plinho F. Hertz

#### ***Highlights***

► High thermal stability in presence of concentrated lactose. ► GOS synthesized with high productivities. ► Effective lactose conversion in a 15 days steady-state operation.

### ***Synthesis of partially hydrolyzed graft copolymer (H-*Ipomoea hederacea* seed gum-g-polyacrylonitrile)***

Original Research Article

Pages 471-478

Mithilesh Yadav, Somit Kumar Singh, Kyong Yop Rhee

### ***Cotton-made cellulose support for anti-allergic pajamas***

Original Research Article

Pages 479-486

Cezar-Doru Radu, Mihaela Salariu, Manuela Avadanei, Cristina Ghiciuc, Lili Foia, Elena Cătălina Lupusoru, Ada Ferri, Eugen Ulea, Florin Lipsa

### ***The hypolipidemic activity of chitosan nanopowder prepared by ultrafine milling***

Original Research Article

Pages 487-491

Wei Zhang, Jiali Zhang, Qixing Jiang, Wenshui Xia

#### ***Highlights***

► The hypolipidemic activities of two chitosan nanopowders were studied in rats. ► Chitosan nanopowder showed better hypolipidemic activity than ordinary chitosan. ► The 51.4-kDa nanopowder

was superior to 315.2-kDa nanopowder in hypolipidemic activity. ► The hypolipidemic mechanism of chitosan nanopowder was studied.

### ***Reaction patterns of wheat starch granules substituted with an anionic propylene oxide analog (POA) revealed by confocal microscopy and 3D anaglyph imaging***

Original Research Article

Pages 492-500

Hyun-Seok Kim, Kerry C. Huber

### ***Methylene blue adsorption on graphene oxide/calcium alginate composites***

Original Research Article

Pages 501-507

Yanhui Li, Qiuju Du, Tonghao Liu, Jiankun Sun, Yonghao Wang, Shaoling Wu, Zonghua Wang, Yanzhi Xia, Linhua Xia

#### ***Highlights***

► A new composite of calcium alginate immobilized graphene oxide was prepared. ► The composite has high adsorption capacity and removal efficiency in the whole studied pH range. ► Methylene blue adsorption is a spontaneous and endothermic process.

### ***Comment on “Microwave synthesized xanthan gum-g-poly(ethylacrylate): An efficient Pb<sup>2+</sup> ion binder” by Sadanand Pandey and Shivani B. Mishra***

Page 508

Yuh-Shan Ho

### ***Prediction of starch pasting properties in barley flour using ATR-MIR spectroscopy***

Original Research Article

Pages 509-514

D. Cozzolino, S. Roumeliotis, J. Eglinton

### ***Influence of water content and drying on the physical structure of native hyaluronan***

Original Research Article

Pages 515-521

Alena Průšová, Frank J. Vergeldt, Jiří Kučerík

### ***Ultrasound assisted cold gelation of kappa carrageenan dispersions***

Original Research Article

Pages 522-529

Rezvan Azizi, Asgar Farahnaky

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***Polysaccharide extraction from *Abelmoschus esculentus*: Optimization by response surface methodology***

Original Research Article

### **Highlights**

► The okra pods can be used as a potential, low cost source of polysaccharides. ► Response surface methodology is an effective tool for optimization of a process. ► The extraction temperature exhibited the most impact on the extraction yield of okra polysaccharides. ► The number of extraction exhibited the least impact on the extraction yield of okra polysaccharides. ► The real experiments demonstrated the validation of the proposed model by RSM.

### ***Interaction of a spirooxazine dye with latex and its photochromic efficiency on cellulosic paper***

Original Research Article

Pages 598-605

Bo Sun, Zhibin He, Qingxi Hou, Zehua Liu, Ruitao Cha, Yonghao Ni

### ***Fuoidan from New Zealand Undaria pinnatifida: Monthly variations and determination of antioxidant activities***

Original Research Article

Pages 606-614

W. Mak, N. Hamid, T. Liu, J. Lu, W.L. White

### **Highlights**

► *U. pinnatifida* sporophyll had multiple times more fuoidan than *U. pinnatifida* blade. ► Crude fuoidan yield and sulphate content increased from winter to spring. ► Crude fuoidan and its fractions exhibited strong antioxidant activities.

### ***Editorial Board***

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