

CELL

DIVISION OF CELLULOSE AND RENEWABLE MATERIALS

M. Roman, *Program Chair*

SUNDAY MORNING

Section A

Moscone Center
252/260

Design & Control in Polysaccharide Chemistry: Anselme Payen Award Symposium in Honor of Kevin J. Edgar | Drug Delivery

Cosponsored by CARB

Financially supported by EPNOE, Eastman Chemical Company, VT Fralin Life Science Institute, VT College of Natural Resources and Environment, VT Department of Sustainable Biomaterials, Carbohydrate Polymers (Elsevier)

P. E. Fardim, O. J. Rojas, *Organizers*

C. M. Buchanan, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 1. Polysaccharides in drug delivery: An overview. **M.F. Wempe**

8:30 2. Polysaccharides in drug delivery: Applications of cellulose derivatives for oral drug delivery. **G. Okoh**

8:55 3. From computational modelling towards mechanistic design of polymers for oral drug delivery. **L.I. Mosquera-Giraldo**, C.H. Borca, X. Meng, Y. Dong, K.J. Edgar, L.V. Slipchenko, L. Taylor

9:20 4. Withdrawn

9:45 Intermission.

10:00 5. Cellulose nanocrystal conjugates for drug delivery and bioimaging applications. **M. Roman**

10:25 6. Supramolecular design of cellulose hydrogel microspheres. **P.E. Fardim**, P. Trivedi, J. Schaller, J. Gustafsson

10:50 7. Immunosensor based on cellulose nanofibrils for C-reactive protein detection. Y. Zhang, **O.J. Rojas**

11:15 8. Self-assembly of *A. Tequilana* fructans and encapsulation of ibuprofen for targeting oral drugs to the colon. **G. Toriz Gonzalez**, C. Miramontes-Corona, J. Ferrer, A. Escalante, E. Delgado, R.I. Corona-Gonzalez, A. Soltero

Section B

Moscone Center
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Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE
J. R. Barone, P. R. Navard, *Organizers, Presiding*

8:05 9. Effect of ethylene glycol-water mixed solvent on the synthesis of iron oxide/carbon nanocomposites and their adsorption performance. **S. Liu**

8:30 10. Solvent-exchanged porous bacterial cellulose nanopaper as reinforcement for polymers. **A. Santmarti**, M. Hervy, K. Lee

8:55 11. Water-based dissolution of wood cellulose and design of novel cellulose-based nanocomposite materials. M. Norgren, J. Yang, C. Costa, A. Eivazihollagh, F. Carlsson, C. Dahlström, B. Medronho, **H. Edlund**, B. Lindman

9:20 12. Facile Method for the Suspension, Dispersion, and Fabrication of Cellulose-based Plastics. D.H. White, C.J. Huntley, **M.L. Curry**

9:45 Intermission.

10:00 13. Cellulose/vaterite nanocomposites: Sonochemical synthesis, and their applications in drug delivery and protein adsorption. **L. Fu**, M. Ma, F. Xu, X. Zhang

10:25 14. Simple synthesis method towards amino-functionalized carbon dots: Carbonization of chitosan. **X. Liu**, J. Pang, F. Xu, X. Zhang

10:50 15. Synthesis and characterization of hydroxypropyl methylcellulose/xyloglucan blend films for release of gentamicin drug. **S. Kondaveeti**

11:15 16. How can a single methyl group drastically modify the microstructure of a biocomposite and affect its mechanical properties?. **A. Gallos**, J. Beaugrand, G. Paes, **F. Allais**

Moscone Center
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Cellulose Structure & Biosynthesis | In the Plant Cell Wall

Cosponsored by BIOL, BIOT, CARB and ENFL
Financially supported by Department of Energy - Office of Science
P. Langan, H. M. O'Neill, J. Zimmer, *Organizers*
N. Carpita, D. Cosgrove, *Organizers, Presiding*

8:00 Introductory Remarks.

8:05 17. 3D Nano-architecture and mechanical properties of *Arabidopsis thaliana* plant cell walls by cryo-electron tomography of vitreous sections. **M. Auer**

8:30 18. Visualizing cellulose microfibril movements during stress-induced and endoglucanase-induced extensions of plant primary cell walls. **D. Cosgrove**

8:55 19. Advances in combining neutron scattering with molecular simulations to understand cell wall structure. **P. Langan**, b. evans, H.M. O'Neill, r. shah, S. Pingali, v. urban, D. Sawada, J. Smith, L. Petridis, d. vural, B.H. Davison

9:20 20. Microfibril orientation, spacing and bundling in secondary cell walls: Implications for catalytic deconstruction. **B.S. Donohoe**, J.D. Hinkle, P.N. Ciesielski, M.F. Crowley, N.S. Mosier, C. Chapple, M. Himmel

9:45 Intermission.

10:00 21. Polymorphic structures and pectin interactions of cellulose in primary plant cell walls from multidimensional solid-state NMR. T. Wang, P. Phyto, H. Yang, S. Kiemle, D. Cosgrove, J.D. Kubicki, **M. Hong**

10:25 22. Mesoscale order of cellulose microfibrils in plant cell walls: Sum Frequency Generation (SFG) vibrational spectroscopy study. **S.H. Kim**

10:50 23. Density functional theory modeling of cellulose polymer assembly. **J.D. Kubicki**, H. Watts, H. Yang, D. Oehme, L. Petridis, Y.G. Yingling

11:15 24. Impact of alterations in lignin deposition on cellulose organization of the plant cell wall. J. Liu, J. Kim, J. Cusumano, C. Chapple, **L. Makowski**

Moscone Center
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Nanocellulose Processing & Analysis | Novel Processes

Cosponsored by AGFD, ANYL, CHAS and I&EC
Financially supported by TAPPI, CelluForce Inc., FPInnovations
W. Y. Hamad, T. Lindström, M. Roman, *Organizers*
M. Bortner, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 25. Deep eutectic solvents in nanocellulose production. **J.A. Sirviö**, M. Visanko, T. Selkälä, H. Liimatainen

8:30 26. Ionic liquid-cellulose-in-oil microemulsions: Molecular weight dependence and directed morphology of cellulose nanoparticles. **J.R. Alston**, N. Redeker, M. Khan, J.M. Mabry

8:55 27. Imidazole: A new tunable reagent for producing nanocellulose. **J. Mao**, H. Abushammala, H. Hettegger, T. Rosenau, M. Laborie

9:20 28. One pot generation of hydrophobic nanocellulose by a multi-functional agent. **J.Y. Fukuda**

9:45 Intermission.

10:00 29. Cellulose nanostructure obtained by enzymatic hydrolysis: The effects of treatment time. **D. Rosa**, C. Bauli, D. Rocha

10:25 30. Investigation of surface interactions of micro/nano-cellulose with metal ions at micro-nano-molecular scale. **C. Zhu**, A. Mathew

10:50 31. Phosphated cellulose nanocrystals: Isolation and bioengineering applications. **S. Camarero-Espinosa**, T. Kuhnt, B. Rothen-Rutishauser, J. Foster, C. Weder

11:15 32. Development of the continuous production process Kyoto process of CNF reinforced plastics. **H. Yano**, F. Nakatsubo, T. Semba, K. Kitagawa

11:40 Concluding Remarks.

Moscone Center
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New Horizons in Sustainable Materials | Renewable Polymers: Isolation, Structure & Properties

Cosponsored by POLY

M. G. Laborie, S. H. Renneckar, N. Robitaille Brown, *Organizers*
N. Sathitsuksanoh, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 33. Plant oil-based acrylic monomers for free radical polymerization. **Z. Demchuk**, I. Tarnavchyk, O. Shevchuk, V. Kirianchuk, A.S. Voronov

8:30 34. Emulsion copolymerization of vinyl acetate with hydrophobic plant oil-based monomers: Effect of plant oil unsaturation of reaction kinetics. **K. Kingsley**, O. Shevchuk, I. Tarnavchyk, A. Voronov

8:55 35. Random copolymerization of lactones and hydroxyacid bioaromatics using one-pot Ring Opening Polymerization (ROP) polycondensation method. **H. Nguyen**, G. Short, P. Qi, S.A. Miller

9:20 36. Water pre- and post-hydrolysis of birch wood to produce high-purity cellulose and xylan-based compounds for material and chemical applications. **M. Borrega**, H. Sixta

9:45 Intermission.

10:00 37. Wood-based hemicelluloses as renewable source for functional materials. **T. Nypelo**, H. Amer, C. Laine, T. Tammelin, J. Konnerth, U. Henniges, A. Potthast, T. Rosenau

10:25 38. Multifunctional materials based on wood derived biopolymer. **H. Zhu**, L. Yang, L. Chen

10:50 39. Novel one step method to prepare carboxycellulose nanofibers from raw biomass and their applications in heavy metal ions remediation. **P. Sharma**, B.T. Chu, B.S. Hsiao

11:15 40. Tertiary amine catalysts for oxidizing the unsaturated components in cellulosic pulp. **G. Afsahi**, K.J. Ruuttunen, T. Vuorinen

11:40 Concluding Remarks.

Moscone Center
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Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

J. Campos-Teran, O. J. Rojas, *Organizers*

M. L. Auad, *Organizer, Presiding*

E. A. Moura, *Presiding*

8:00 Introductory Remarks.

8:05 41. Development of novelty Figue textile fabrics for clothing applications. **M. Restrepo**, M.C. Amaya, J. Manrique, P. Gañán, L. Velez, R. Zuluaga Gallego, C. Castro Herazo

8:30 42. Novel recycling process for cotton polyester blended waste textiles. **S. Haslinger**, M. Hummel, H. Sixta

8:55 43. Nanocellulose recovery from industrial bagasse of agave tequilana. **B.C. Sulbaran**, J. Hernandez, **G. Toriz Gonzalez**, O.J. Rojas, M.A. Escalante

9:20 44. Biocatalytic functionalization of softwood galactoglucomannan through transglycosylation and enzyme engineering. **J. Morrill**, A. Rosengren, S. Butler, H. Stålbrand

9:45 Intermission.

10:00 45. Electrodes with nanostructures used in the electrochemical analysis of pesticides in aquifers means of organic and conventional banana production in Costa Rica. **R. Zamora**, R. Starbird

10:25 46. Modified soy protein as encapsulate excipient in pharmaceutical applications. **M. Anaya Castro**, I. Alric, S. Fullana-Girod, V. Durrieu

10:50 47. Incorporating cellulosic passion fruit residues into pectin edible plastics. **D.R. Munhoz**, F.K. Moreira, L.H. Mattoso

11:15 48. Residues from agroindustry as reinforcement in foams based on PBAT/PLA blend. T.T. Freitas, R. Coiado, G. Lazo, R. Oliveira, **E.A. Moura**

SUNDAY AFTERNOON

Section A

Moscone Center
252/260

Design & Control in Polysaccharide Chemistry: Anselme Payen Award Symposium in Honor of Kevin J. Edgar | Tissue Engineering

Cosponsored by CARB

Financially supported by EPNOE, Eastman Chemical Company, VT Fralin Life Science Institute, VT College of Natural Resources and Environment, VT Department of Sustainable Biomaterials, Carbohydrate Polymers (Elsevier)

C. M. Buchanan, O. J. Rojas, *Organizers*

P. E. Fardim, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 49. Tubular biocellulose hydrogels act as temporarily implanted in vivo scaffolds and cause regeneration of bile duct by body own tissue. **D.O. Klemm**, F. Rauchfuss, F. Kramer, K. Petzold-Welcke, W. Fried, U. Settmacher

1:30 50. Nano-designed polysaccharide-based constructs for tissue engineering applications. **J.F. Mano**

1:55 51. Chemoenzymatic strategy to design alginates for tissue engineering. **G. Skjak-Brak**

2:20 52. Manufacturing, characterization and use of substrates for regenerative medicine based on the specific properties of polysaccharide derivatives and biodegradable polymers. R. Kargl, T. Mohan, C. Nagaraj, A. Dobaj Štiglic, A. Olschewski, U. Maver, **K. Stana Kleinschek**

2:45 Intermission.

3:00 53. Glycosaminoglycan nanostructures as mimics of the vascular endothelial glycocalyx. **M. Kipper**

3:25 54. Polysaccharide based micro-nano structures for tissue engineering. **S.G. Kumbar**

3:50 55. Development and characterization of biomembranes combining chitosan and natural-nanoliposomes for tissue engineering applications. **F. Cleymand**, E. Velot, P. Menu, E. Arab-Tehrany, J.F. Mano

4:15 56. Bottom-up fabrication of hybrid polysaccharide/peptide amphiphile supramolecular multilayered biomaterials by combining self-assembly and layer-by-layer assembly approaches. **J. Borges**, M.P. Sousa, G. Cinar, S. Caridade, M.O. Guler, J.F. Mano

Moscone Center
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Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE

J. R. Barone, P. R. Navard, *Organizers, Presiding*

1:05 57. Role of non-cellulosic components on the microstructure and physical properties of natural fibres and their biocomposites. **N. Le Moigne**, J. Acéra Fernandez, A. Caro-bretelle, R. El Hage, A. Le Duc, M. Lozachmeur, P. Bono, A. Bergeret

1:30 58. Influence of biochemical and histological characteristics on the properties of miscanthus-polypropylene composites. **J. Girones**, L. Vo, E. Gineau , G. Mouille, S. Arnoult, C. Lapierre, M. Brancourt, P.R. Navard

1:55 59. Lignin- polyvinyl alcohol photo-cured composite films. Effect of lignin and UV curing agent quantity on the mechanical, optical and chemical properties. **A. Suarez**, L.Y. Perez

2:20 60. Challenges of utilizing different lignins and blends for carbon fibers. **M. Cho**, L. Ji, M. Karaaslan, F.K. Ko, S. Renneckar

2:45 Intermission.

3:00 61. Molecular dynamics simulation study of moisture effects on chain mobility in hemicellulose-based bio-nanocomposites as observed by ¹³C CP/MAS NMR relaxometry. **P. Chen**, C. Terenzi, L. Berglund, J. Wohlert

3:25 62. What defines fiber quality in wood refining? **M. Tasooji**, C.E. Frazier

3:50 63. Withdrawn

4:15 64. Treatments of cellulosic fibers to reduce the water absorption in composite reinforcement. **M. Ardanuy**, H. Ventura, J. Claramunt

Moscone Center
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Cellulose Structure & Biosynthesis | Evolution of Synthases & Fine Structure of Microfibrils

Cosponsored by BIOL, BIOT, CARB and ENFL

Financially supported by Department of Energy - Office of Science

N. Carpita, D. Cosgrove, H. M. O'Neill, J. Zimmer, *Organizers*
P. Langan, *Organizer, Presiding*
C. H. Haigler, *Presiding*

1:00 Introductory Remarks.

1:05 65. Evolutionary perspectives on functional differentiation of CESA proteins. **A.W. Roberts**

1:30 66. Using animal models to study cellulose biosynthesis. **K. Nakashima**

1:55 67. Aminoethyl cellulose in bacteria: Structure, biosynthesis, and implications. **L. Cegelski**

2:20 68. How many twists in cellulose biosynthesis can we still expect? **U. Römling**

2:45 Intermission.

3:00 69. Patterns in cellulose fibril formation. **M.F. Crowley**, M. Himmel, L. Bu

3:25 70. Can an 18-chain cellulose microfibril explain the scattering/diffraction data? **Y. Nishiyama**, Y. Ogawa, T. Kuribayashi

3:50 71. Relations between co-crystallization and multiscale hydration in celluloses isolated from plants. M.M. Oliveira, A.A. Curvelo, **C. Driemeier**

4:15 72. Understanding the mechanical induction of macromolecular defects in cellulose nanofibrils by molecular dynamics simulation and scanning probe microscopy. **P.N. Ciesielski**, R. Wagner, V. Bharadwaj, M. Himmel, J. Killgore, M.F. Crowley

Section D

Moscone Center
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Nanocellulose Processing & Analysis | Process Parameters

Cosponsored by AGFD, ANYL, CHAS and I&EC
Financially supported by TAPPI, CelluForce Inc., FP Innovations
M. Bortner, T. Lindström, M. Roman, *Organizers*
W. Y. Hamad, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 73. Limiting factors for cellulose nanocrystal yield assessed via TEMPO-mediated oxidation of microcrystalline cellulose. **E. Kontturi**, R. Salminen, M. Reza, J. Peyre, T. Pääkkönen

1:30 74. Characterization and patterning of anthraquinone functionalized cellulose nanocrystals. **A. Sulkanen**, Y. Si, G. Sun, G. Liu

1:55 75. Surface polarity engineering of crystalline nanocellulose using a food-grade surfactant for improved sustainable biocomposites. **K. Chi**, J.M. Catchmark

2:20 76. Microfibrillated cellulose produced with a high consistency enzymatic process. **T.C. Maloney**, K. Dimic-Misic, S. Ceccherini, J. Kuusisto, A. Suurnäkki, O. Mattila, S. Grönqvist

2:45 Intermission.

3:00 77. Determination of hydrophobicity in amphiphilic nanocellulose imparted by Aqueous Counter Collision (ACC). **T. Kondo**, K. Tsuboi, S. Yokota

3:25 78. Understanding cell wall longitudinal structure for producing cellulose nanofibrils by disk milling with dilute acid prehydrolysis. **J. Zhu**

3:50 79. Cellulose fibre in situ fibrillation by twin screw extrusion. **F. Rol**, o. Nechporchuk, B. Karakashov, n. Belgacem, J. Bras

4:15 80. Influence of monosaccharide composition in TEMPO-mediated oxidation to produce cellulose nanofibrils from corn husk and banana rachis. **C. Gomez Hoyos**, J. Velázquez-Cock, A.M. Serpa Guerra, R. Zuluaga Gallego, C. Castro Herazo

4:40 Concluding Remarks.

Section E

Moscone Center
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New Horizons in Sustainable Materials | Nanocellulose Materials & 3D Structures

Cosponsored by POLY

M. G. Laborie, N. Robitaille Brown, N. Sathitsuksanoh, *Organizers*

S. H. Renneckar, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 81. Environmental effects on the organization and structure of mechanically adaptable biopolymer networks. **Z. Walsh**, L. Averous

1:30 82. Hydrodynamic stability of reacting multilayer flows in a Hele-Shaw cell. **J. MacKenzie**

1:55 83. 3D printing of cellulose nanocrystals and nanocomposites. **G. Siqueira**, D. Kokkinis, R. Libanori, M. hausmann, S. Gladman, A. Neels, P. Tingaut, T. Zimmermann, J. Lewis, A. Studart

2:20 84. Cellulose nanofibril-cell adhesive peptide conjugates for 3D bioprinted tissue models. **E. Karabulut**, A. Sousa Morais, P. Gatenholm

2:45 Intermission.

3:00 85. Functional lignocellulosic materials: Engineering smart bio-hybrids from a natural anisotropic scaffold. **E. Cabane**, T. Keplinger, S. Kostic, M. Vidiella del Blanco, S. Vitas, Y. Wang, I. Burgert

3:25 86. Non-proteolytically digestible micro-patterning cell scaffolds by inkjet-printing of chitinous nanocrystals. **Y. Teramoto**, S. Suzuki, T. Katsuragawa

3:50 87. Chemical modifications for the synthesis of functional materials from sustainable nano/cellulose. **K. Zhang**

4:15 Introduction of the KINGFA Award winner.

4:20 88. Optimizing both thermal and colloidal stability of cellulose nanocrystal through acid hydrolysis. **E.D. Cranston**, O. Vanderfleet, M.S. Reid

Section F

Moscone Center
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Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

M. L. Auad, O. J. Rojas, *Organizers*

J. Campos-Teran, *Organizer, Presiding*

K. A. Oksman, *Presiding*

1:00 Introductory Remarks.

1:05 89. Biomass conversion into functional bioplastics and gels. **U.M. Edlund**

1:30 90. Effect of the culture medium in the production of bacterial cellulose from kombucha. J. Gutiérrez-Castañeda, M. Hernández-Guerrero, S. Revah, **J. Campos-Teran**, G. Viguera

1:55 91. Sugar produced from corncob pretreated with the combination of electron beam irradiation and enzymes. E.S. Pascoal, E.K. Kleingesinds, E.A. Moura, A.B. Lugão, **R.C. Rodrigues**

2:20 92. Chromatographic purification of sugar cane bagasse alkaline extract. **v. oriez**, P. Pontalier, J. Peydecastaing

2:45 Intermission.

3:00 93. Energy efficient separation process of nanofibrils from bioresidues and their use in biocomposites. **K.A. Oksman**, L. Berglund, Y. Aitomaki

3:25 94. Torrefaction analysis of woody biomasses from fast-growing plantations of Costa Rica. R. Moya, A. Rodríguez-Zúñiga, **A. Puente**

3:50 95. Scaled-up production of biodegradable pectin plastics using continuous casting. L.B. Norcino, D.R. Munhoz, **F.K. Moreira**, L.H. Mattoso

4:15 96. α -Eleostearic acid extraction by saponification of tung oil and its subsequent polymerization. **A. Murawski**, R. Quirino

Holy Grails in Chemistry: Celebrating the 50th Anniversary of Accounts of Chemical Research Journal

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SUNDAY EVENING

Section A

Moscone Center
Hall D

General Posters

M. Roman, *Organizer*

7:00 - 9:00

97. Aminoethyl cellulose: *E. coli*'s building material for a biofilm matrix. **W. Thongsomboon**, L. Cegelski

98. From cellulose tissue papers to nanoporous membrane actuators. **H. Lin**, J.W. Dunlop, J. Yuan

99. Understanding protein adsorption to TEMPO-oxidized cellulose microfibrils. **S. Cobos**, B. Nemmaru, S.P. Chundawat, D. Athanasopoulos

100. Combined steam and dry reforming of methane over nickel-based catalysts for upgrading biomass gasification-derived syngas. **E. Terrell**, C. Theegala

- 101.** Acetic acid as a precatalyst to promote cellulose dissolution. **Y. Hu, S. Acharya,** N. Abidi
- 102.** Molecular dynamics study of chitin crystal models in ionic liquids. **T. Uto,** K. Yamamoto, J. Kadokawa
- 103.** Preparation of amylose-grafted chitin nanofiber gels. **N. Egashira,** K. Yamamoto, J. Kadokawa
- 104.** Chemoenzymatic synthesis and gelation behavior of amylose-grafted poly(γ -glutamic acid). **T. Shouji,** J. Kadokawa, K. Yamamoto
- 105.** Withdrawn
- 106.** Polyamide-polysiloxane-copolymers as examples for partially biobased thermoplastic elastomers. **M.A. Haslböck,** C. Zollfrank
- 107.** Antibacterial chitosan films containing quaternary ammonium salts modified nanocrystalline cellulose. **L. Ying,** X. Ren, G. Buschle-Diller
- 108.** Facile synthesis of high strength and oxygen-barrier performance of hot-water wood extract films. **G. Chen,** G. Fu, X. Qi, F. Peng, C. Yao, R. Sun
- 109.** Kinetics of chain scission and of total oxidative damage in the Fenton-induced degradation of cereal β -glucan. **S. Boulos,** N. Burkhardt, L. Nystroem
- 110.** Drug delivery mechanism of sulfathiazole in films. **M.L. Auad,** M. Barde, M. Davis, S. Rangari
- 111.** 3D Porous structures based on lignin. **M.L. Auad,** I. Flipponen, T. Hinkle, C. Upp
- 112.** What are the ranges and basis of auxeticity in the phases of cellulose microfibrils?. **A. Asamoah**
- 113.** Laccase-polymerization of ultrasound extracted bamboo substrates. **J. Fu,** A. Cavaco-Paulo
- 114.** Toward development of new generation of peat granular products for waste water remediation: Reaction mechanism of peat surface with cations of heavy metals. **V.G. Goncharov,** H.J. Leopold, L. Kildyshova, **I.V. Kolomitsyn**
- 115.** Preparation and characterization of antibacterial films by pretreatment of dioxane from *Phyllostachys pubescens*. **Q.W. Li, G. Hui, R. Jun,** G. Ying
- 116.** High strength of biocomposite film prepared from hemicelluloses and cellulose. **R. Jun, G. Ying, Q.W. Li, H. Gao**

- 117.** Grafting of polyoxazoline on chitin nanofiber film to form organo- and hydrogels. **J. Yoshida**, K. Yamamoto, J. Kadokawa
- 118.** Novel approach to achieve thermoplastic arabinoxylan. **M.E. Borjesson**, G.J. Westman, A. Larsson, A. Ström
- 119.** Development and investigation of a cellulose-based low adhesion coating for adhesive tapes. **S. von Gradowski**, M. Nau, M.A. Biesalski
- 120.** Influence of nanofibrillation degree on nanocellulosic aerogel properties. J. Desmaison, B. Seantier, A. Dufresne, **J. Bras**
- 121.** Direct comparison of protein and lignocellulose fibers as reinforcements in polymer matrix composites. A.M. Davis, **L.E. Hanzly**, B.L. DeButts, J.R. Barone
- 122.** Technical lignins modified by hydroxymethylation for the production of high pressure laminates: Synthesis, characterization and mathematical modelling. M. Taverna, V.V. Nicolau, **D. Estenoz**
- 123.** Dimensional stability analysis of flax fiber reinforced polypropylene composites. A.M. Davis, **L.E. Hanzly**, B.L. DeButts, J.R. Barone
- 124.** Evaluating seafood industry waste products as valuable sources of chitin and chitosan. **B. Barnes**, P. Sharma, U. Onuchukwu, V. Volkis
- 125.** Mussel-inspired polysaccharide derivatives as examples of novel strong bioadhesives. **M. Petzold**, C. Zollfrank
- 126.** Disruption of cellulose fibers structure by Lytic Polysaccharide Monooxygenase (LPMO) enzymes. **A. Villares**, C. Moreau, C. Bennati-Granier, S. Garajova, B. Saake, J. Berrin, B. Cathala
- 127.** Easy process to cellulose-silica hybrid aerogels. **A. Berkefeld**, M. Schestakow
- 128.** Algae-based biorefinery of *Chlorella vulgaris*. **G. Vaca Medina**, C. Mathieu, C. Raynaud
- 129.** Fabrication of CNC/glycerol thin films as substrate for electronic applications. **M. Rivera**, V. Pantojas
- 130.** Optimization of phenolics extraction from walnut shells through ultrasound treatment. **H. Han**, F. Zhang, Y. Wang, J. Jensen, M. Rakita, Q. Han, S. Janaswamy, Q. Xu
- 131.** Cellulose nanofiber surface functionalization for functional medical membrane applications. H. Durand, H. Le Drezen, n. Belgacem, E. Zeno, **J. Bras**

- 132.** Effects of catalytic fast pyrolysis derivatives on mechanical, thermal and surface properties of nanocellulose films. **R. Zhang**, N. Wilson, M.R. Nimlos, M. Himmel, P.N. Ciesielski
- 133.** Impact of vanillin on the rheological and phase behavior of Cellulose Nanocrystals (CNCs). **J. Mao**, R. Ma, M. Laborie
- 134.** Enhancement of PVA/MMT composite film by chitin nanowhiskers. **Y. Guan**, H. Gao, L. Zhang
- 135.** Withdrawn
- 136.** Aqueous dispersions of TEMPO-oxidized cellulose nanofibrils with various metal counterions, and their super deodorant performances. **A. Sone**, T. Saito, A. Isogai
- 137.** Microwave-hydrothermal rapid synthesis of cellulose/Ag nanocomposites and their antibacterial activity. **L. Fu**, Y. Liu, S. Liu, M. Ma
- 138.** Withdrawn
- 139.** Sustainable polymer synthesized from gemini monomers. **Z. Wang**
- 140.** Analysis of Liquid Fuels from Thermal Depolymerization of Polypropylene in a Bench-Scale Reactor. **S.M. Cardinalli**, **J.M. Lemas**, S. Ramesh, J.E. Holm, C.J. Pope
- 141.** Conductive films prepared from cellulose, graphite and polyaniline nanoparticles with highly thermal stability and antibacterial activity. **J. Chen**, J. Liu, W. Zhang, K. Wang, X. Qian, R. Sun
- 142.** Recycling of non-metallic fraction of printed circuit boards as reinforcement in poly(methyl methacrylate) composites. **C. Loyo**, C. Arroyo, V. Valle, M. Aldas
- 143.** Applications of cellulosic waste. Development of insulation panels. L. Beltramini, R. Grether, **A. Guillarducci**, N. Ulibarrie
- 144.** Controlling latex morphology with cellulose nanocrystals and methyl cellulose. **S.A. Kedzior**, B. Morgan, E. Joy, Z. Hu, E.D. Cranston
- 145.** Synthesis of encapsulated bio-pesticides/fertilizers based on superabsorbent crosslinked alginate microbeads. **P. Joshi**, **M.L. Auad**
- 146.** Characterization of cellulose membrane filters deposited by electrospinning. **J.L. Berrios-Rivera**, V. Pantojas
- 147.** Sequential fractionation of lignin macromolecules with organic solvents and investigation of their potentials for utilization as lignin-PLA copolymers. **S. Park**, J. Choi

- 148.** Development of reinforced rigid polyurethane foam composite based on cabuya fiber. **A. Proano**
- 149.** Biopolymer synthesis: Esterification of wood cellulose from different Guatemalan tree species with phthalic anhydride and their use as triclosan adsorbents in aqueous solutions. **C.E. Torres, J. Carrera, S. Toledo**
- 150.** Cleavage of β -O-4 ether bonds in acidic lithium bromide trihydrate for lignin depolymerization. **N. Li, X. Yang, X. Lin, X. Pan**
- 151.** Conductive hydrogels for use in tissue engineering and biocompatible electronics. **B. Cleary, M.L. Auad**
- 152.** Preparation of electrospun mats of functionalized Nano-Crystalline Cellulose (NCC). **R. Farag, Z. Jiang, B. Jackson, K. Brown, M.L. Auad**
- 153.** Cellulose nanocrystal thin film swelling to probe particle-particle interactions in solvents and aqueous media. **M.S. Reid, S.A. Kedzior, M. Villalobos, E.D. Cranston**
- 154.** Characterization of edible film based on zein and chitosan. **L. Pinho, M. Oliveira, W.Q. Oliveira, R. Furtado, M.S. Bastos, R. Figueira**
- 155.** Pre-treatments to create porous cellulose fibres for nanocellulose production. **M. Miranda, C. Driemeier, A.J. Carvalho, n. Belgacem, J. Bras**
- 156.** Succinylation of glucomannans from spruce for hydrogel formation. **A. Escalante, K. Markstedt, P. Gatenholm, G. Toriz Gonzalez**
- 157.** Biomass potential for the development of advanced materials and bio-based products. **M. Kurečić, S. Hribernik, M. Bozic, A. Ojstršek, T. Kos, M. Mešl, K. Stana Kleinschek**
- 158.** Gelation of 3D printed nanocellulose induced by crosslinked hemicellulose. **K. Markstedt, A. Escalante, G. Toriz Gonzalez, P. Gatenholm**
- 159.** Effect of the change of the crystalline structure on the infrared spectra by ATR of cellulose from banana rachis, corn husk and bacterial cellulose. **A.M. Serpa Guerra, C. Gómez Hoyos, J.A. Velasquez- Cock, P. Gañán, C. Castro Herazo, R. Zuluaga Gallego**
- 160.** Bacterial nanocellulose based bioink for 3D bioprinting. **K. Markstedt, D. Hägg, T. Kondo, G. Toriz Gonzalez, P. Gatenholm**
- 161.** Characterization of wood and cellulose from different eucalyptus species. **R. Teixeira Mendonça, I. Carrillo, M. Pereira**
- 162.** Biomaterial polymer blends for material extrusion 3D printing. **P. Tayeb, L. Pal, A.H. Tayeb**

- 163.** Solution/aggregation behavior of spruce xylan as function of isolation/purification conditions. **S. Kishani**, A. Escalante, **G. Toriz Gonzalez**, L. Wagberg, P. Gatenholm
- 164.** Extraction and characterization of nanocellulose from different biomass sources. **M. Alwohaibi**, C.J. Huntley, M.L. Curry
- 165.** Synthesis and fabrication of CNF-based plastic nanocomposites. **D.H. White**, C.J. Huntley, M.L. Curry
- 166.** Molecular blending and reinforcing effect of lignin in ductile epoxy resins. F. Ansari, **R. Rojas Escontrillas**, L. Berglund
- 167.** TEMPO- oxidized Nanofibrillated Cellulose Film (NFC) incorporating Graphene oxide (GO) nanofillers. **Y. Kim**, Y. Kim
- 168.** Enhanced solar driven water evaporation rates through graphitic surface film suspensions. **R. Christoph**, A. Hernández, R. Muñoz, S. Ventura

**Holy Grails in Chemistry: Celebrating the 50th Anniversary of Accounts of Chemical Research Journal
(CANCELLED)**

Sponsored by PRES, Cosponsored by BIOL, BMGT, CARB, CATL, CELL, COLL, ENVR, HIST, I&EC, MEDI, ORGN and PROF

MONDAY MORNING

Section A

Moscone Center
252/260

Design & Control in Polysaccharide Chemistry: Anselme Payen Award Symposium in Honor of Kevin J. Edgar | Structure

Cosponsored by CARB
Financially supported by EPNOE, Eastman Chemical Company, VT Fralin Life Science Institute, VT College of Natural Resources and Environment, VT Department of Sustainable Biomaterials, Carbohydrate Polymers (Elsevier)
C. M. Buchanan, P. E. Fardim, *Organizers*
O. J. Rojas, *Organizer, Presiding*

8:00 Introductory Remarks.

- 8:05 169.** Repeating unit of cellulose is glucose, and why that matters. **A.D. French**
- 8:30 170.** Findings on the way of cellulose ether analysis. **P. Mischnick**, K. Voiges, S. Gangula
- 8:55 171.** Withdrawn
- 9:20 172.** Rheo-optical and optical studies of cellulose derivatives. **P.R. Navard**, T. Budtova
- 9:45** Intermission.
- 10:00 173.** Insights in the control of glycosaminoglycan structure. **R.J. Linhardt**
- 10:25 174.** Precision biomaterials based on synthetic heparan sulfate oligosaccharides. **G. Boons**
- 10:50 175.** New views of plant cell wall non-cellulosic polysaccharide and proteoglycan structure from studies of pectin biosynthetic enzymes and plants modified in their expression. **D. Mohnen**, M. Atmodjo, A. Biswal, R. Amos, K. Engle, L. Tan
- 11:15 176.** Conversion of agricultural by-products to methyl cellulose. **A. Biswas**, H. Cheng, R. Furtado, C.R. Alves

Section B

Moscone Center
262

Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE
P. R. Navard, *Organizer*
J. R. Barone, *Organizer, Presiding*

- 8:05 177.** Mechanical properties improvement of natural rubber/pineapple leaf fiber composites: Effects of silane treatment of fiber and incorporation of carbon black. **N. Hariwongsanupab**, k. mougin, T. Amornsakchai, M. Vallat, S. Thanawan, G. Schrodj
- 8:30 178.** Substitution of formaldehyde in phenolic thermosets with innovative and bio-based lignin-to-vanillin derived compounds. **S. Caillol**
- 8:55 179.** Manufacturing strong regenerated cellulose fibers reinforced with cellulose nanocrystals. **J. Bhardwaj**, R. Richardson, J. Li, S. Rahatekar
- 9:20 180.** Micro and nano composites using cotton materials loaded in polylactic acid and applications in 3D printing. A. Kearns, **R.A. Venditti**, J. Jur, N. Farahbakhsh
- 9:45** Intermission.

10:00 181. Design, fabrication and test of degradable starch based tube for a biomedical application. L. Chaunier, D. Velasquez, S. Guessasma, A. Bizeau, F. Faure, A. Meddahi-Pelle, **D. Lourdin**

10:25 182. Blend configuration in polymeric materials with very high lignin-derivative contents. **S. Sarkanen**, Y. Wang, Y. Chen

10:50 183. Lignin acidolysis predicts formaldehyde generation in pine wood. **C.E. Frazier**, G. Wan

11:15 184. Amyloid reinforced polyvinyl alcohol nanocomposites. B.L. DeButts, **J.R. Barone**

Section C

Moscone Center
270

Cellulose Structure & Biosynthesis | Mechanism of Synthesis

Cosponsored by BIOL, BIOT, CARB and ENFL
Financially supported by Department of Energy - Office of Science
N. Carpita, D. Cosgrove, P. Langan, H. M. O'Neill, *Organizers*
J. Zimmer, *Organizer, Presiding*
A. W. Roberts, *Presiding*

8:00 Introductory Remarks.

8:05 185. Structure and function of cellulose synthase. **J. Zimmer**

8:30 186. Cellulose microfibril formation in vitro by a single heterologously expressed plant cellulose synthase isoform. **P. Pallinti**, S. Cho, S. Díaz-Moreno, M. Kumar, B. Nixon, V. BULONE, J. Zimmer

8:55 187. All-atom structural models of plant cellulose synthase and cellulose synthase complex. A. Singh, S. Deshmukh, **Y.G. Yingling**

9:20 188. Organization of domains in CESA proteins of the plant cellulose synthesis complex. **H.M. O'Neill**, V. Vandavasi, J. Du, Q. Zhang, A. Singh, B. Nixon, Y.G. Yingling, L. Petridis, P. Langan, C.H. Haigler

9:45 Intermission.

10:00 189. Progress toward structural understanding of cellulose synthesis by plants. **B. Nixon**, M. Kumar, J. Du, S. Cho, V. Vandavasi, H.M. O'Neill, P. Purushotham, J. Zimmer

10:25 190. Cellulose structure and biosynthesis in oomycetes: Similitudes and differences with higher plants. **V. Bulone**

10:50 191. Protein structural controls of plant cellulose synthesis. **C.H. Haigler**

11:15 192. Structure of the catalytic domain of a plant CesA. P.S. Rushton, C. Rayon, A.T. Olek, L. Makowski, H. Kim, J. Badger, D. Kihara, C. Steussy, C.V. Stauffacher, **N. Carpita**

Section D

Moscone Center
272

Nanocellulose Processing & Analysis | Properties

Cosponsored by AGFD, ANYL, CHAS and I&EC
Financially supported by TAPPI, CelluForce Inc., FPIInnovations
M. Bortner, W. Y. Hamad, T. Lindström, *Organizers*
M. Roman, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 193. Solid-State and structural characterization of cellulose nanocrystals. **W.Y. Hamad**

8:30 194. Comparing crystallinities of CNCs by Raman, NMR, and XRD. **U.P. Agarwal**, T. Larsson, J. Stevanic Srndovi

8:55 195. Analysis of modified cellulose nanocrystals. **W. Thielemans**

9:20 196. Characterization of nanocelluloses using small-angle neutron, x-ray and dynamic light scattering techniques. Y. Mao, K. Liu, C. Zhan, L. Geng, B.T. Chu, **B.S. Hsiao**

9:45 Intermission.

10:00 197. Occupational health and safety characterization and assessment of CNC's from North American producers. **B. O'Connor**

10:25 198. European perspective on Environmental, Health and Safety (EHS) aspects on Cellulose Nanofibrils (CNF). **H. Kangas**, M. Pitkänen, J. Catalan, H. Norppa

10:50 199. TEMPO-Oxidized Cellulose Nanofiber (TOCN) materials show good biomedical applications. **N. Ruizhi**, L. Yi, S. Yamasaki, J. Lin, T. Saito, A. Isogai

11:15 200. Different size-unified cellulose nanocrystals obtained via a multistage separation. **Y. Hu**, N. Abidi

11:40 Concluding Remarks.

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | Tuning Interfacial Phenomena with Ligno-Nanocellulosic Materials

Cosponsored by CARB and COLL

Financially supported by EPNOE

M. K. Ek, E. Filpponen, T. Nypelo, S. Peresin, S. Spirk, *Organizers, Presiding*

8:00 Introductory Remarks.

8:05 201. Nanocellulose- Silver hybrid structuration for stable suspension and transparent conductive material design. **J. Bras**, F. Hoeng, A. Denneulin

8:30 202. Control of the surface properties of cellulose nanocrystals by acylation with functional vinyl esters: Application to the design of innovative fillers or Pickering surfactants. **G. Sebe**, J. Brand, B. Dhuiege, A. Werner, V. Héroguez

8:55 203. Click-Thiols as an approach to implement novel functionalities within bio-derived scaffolds. **S. Kostic**, J.K. Berg , K. Casdorff, V. Merk, I. Burgert, E. Cabane

9:20 204. Cellulose nanocrystals and surfactants as mini emulsion polymerization stabilizers. **S.A. Kedzior**, H.S. Marway, E.D. Cranston

9:45 Intermission.

10:00 205. Fundamental differences due to deposition method in ultrathin films of cellulose nanofibres. **B.P. Wilson**, K. Yliniemi, M. Gestranus, M. Putkonen, M. Lundström, T. Tammelin, E. Kontturi

10:25 206. Tailor-made 3D printed scaffolds from cellulose nanofibrils for guided growth and development of a neural tissue. **V. Kuzmenko**, E. Karabulut, E. Pernevik, D. Hägg, S. Johannesson, P. Enoksson, P. Gatenholm

10:50 207. 3D-printing of cellulosic materials – properties and suitability on cellulosic fabrics. **T. Tenhunen**, P. Varis, A. Puolakka, P. Kääriäinen, A. Harlin, M.K. Österberg, T. Tammelin, H. Orelma

11:15 208. Cellulose macro-sheets with PTFE nanocoating and cellulose nano-sheets. **Y. Huang**, M. Wu, M. Zhao, S. Kuga

Moscone Center
276

Chemistry & Physical Chemistry of Thermal Processes for the Circular Carbon Economy

Cosponsored by ENFL and ENVR
H. Mayes, C. J. Pope, *Organizers, Presiding*

8:00 Introductory Remarks.

8:05 209. Hydrothermal carbonization and the circular economy. **M.T. Timko**

8:30 210. Utilization of microwave irradiation in the catalytic upgrade of cellulose and hemicellulose derivatives: Hydrolysis and hydrogenation reactions. **J. Lopez-Sanchez**

8:55 211. Biomass vapor upgrading to produce hydrocarbon fuels. **C. Mukarakate**, K. Iisa, M. Xu, M.R. Nimlos, J. Schaidle

9:20 212. Oceans of plastic converted to liquid fuels via small scale thermal depolymerization reactors. **S. Ramesh, J.E. Holm, C.J. Pope**

9:45 Intermission.

10:00 213. Data science tools for biomass pyrolysis – application to thermochemical conversion of lignin. **J. Pfaendtner**

10:25 214. Mechanistic modeling of fast pyrolysis of hemicellulose extracted from cornstover. **X. Zhou**, W. Li, R. Mabon, L.J. Broadbelt

10:50 215. On the importance of inorganics composition on biomass gasification. **D. Da Silva Perez**, C. Dupont

11:15 216. Computational studies of lignin chemistry and structure. G. Beckham, L. Berstis, **M.F. Crowley**, R.A. Dixon, T.J. Elder, S. Kim, J. Vermaas

11:40 Concluding Remarks.

Science for a Sustainable Energy Future | Energy Storage

Sponsored by PRES, Cosponsored by BIOL, BIOT, BMGT, CARB, CATL, CEI, CELL, COLL, ENFL, ENVR, GEOC, I&EC, MEDI, MPPG[‡], ORGN and PROF

MONDAY AFTERNOON

Section A

Moscone Center
252/260

Design & Control in Polysaccharide Chemistry: Anselme Payen Award Symposium in Honor of Kevin J. Edgar | Structure

Cosponsored by CARB

Financially supported by EPNOE, Eastman Chemical Company, VT Fralin Life Science Institute, VT College of Natural Resources and Environment, VT Department of Sustainable Biomaterials, Carbohydrate Polymers (Elsevier)

C. M. Buchanan, O. J. Rojas, *Organizers*

P. E. Fardim, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 217. Chemistry with activated polysaccharide derivatives – an efficient and simple path to novel structures. **T.J. Heinze**, T. Elschner, M. Gericke, K. Ganske, F. Obst, L. Gabriel

1:30 218. Withdrawn

1:55 219. LB film preparation of regioselectively substituted cellulose cinnamates on nematic ordered cellulose templates. **T. Kondo**

2:20 220. Take advantage of what Nature creates and utilize biomass. **A. Albertsson**

2:45 Intermission.

3:00 221. Enzymatic control of the acetylation pattern in chitosans. **B.M. Moerschbacher**

3:25 222. Studying the reactivity of cellulose by oxidation with 4-acetamido-2,2,6,6-tetramethylpiperidine-1-oxo-piperidinium cation. **P. Khanjani**, V. Lovikka, T.C. Maloney, T. Vuorinen

Section B

Moscone Center
262

Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE

P. R. Navard, *Organizer*

J. R. Barone, *Organizer, Presiding*

J. Ganster, *Presiding*

1:05 223. Orientation and interfacial stress transfer of cellulose nanocrystal nanocomposite fibers. **H. Chang**, J. Luo , H.c. Liu, A. Bakhtiary Davijani , P. Wang, S. Kumar

1:30 224. Understanding nanoconfinement and nanoscale interfaces in nanocellulose composites. **S. Keten**

1:55 225. Enhancing supramolecular interactions in aromatic polymer/cellulose nanocrystals nanocomposites. E. Rivoire, A. Garcia, A. Saralegi, J. Foster, **J. Bras**

2:20 226. Excellent dispersion and property enhancements in polymer composites made with biobased filler from cellulose nanocrystals and waste paper to lignin and agro-waste to rice husk ash and eggshell. **J.M. Torkelson**, K.A. Iyer, G.T. Schueneman

2:45 Intermission.

3:00 227. Amyloid reinforced rubber nanocomposites. B.L. DeButts, L.E. Hanzly, **J.R. Barone**

3:25 228. Melt mixing cellulose nanocrystals and industrially relevant polymers. **J. Foster**

Section C

Moscone Center
270

Cellulose Structure & Biosynthesis | Synthase Trafficking & Synthesis of plant (1->3),(1->4)-D-glucans

Cosponsored by BIOL, BIOT, CARB and ENFL
Financially supported by Department of Energy - Office of Science
N. Carpita, D. Cosgrove, P. Langan, J. Zimmer, *Organizers*
H. M. O'Neill, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 229. Cellular mechanisms of CESA trafficking and delivery to the plasma membrane. T. Vellosillo, R.X. Gutierrez, C.R. Somerville, **D.W. Ehrhardt**

1:30 230. Does cortical microtubule array guide the orientation of cellulose deposition or not? **Y. Gu**

1:55 231. Myosins XI are involved in cellulose synthase complex dynamics and delivery. W. Zhang, C. Cai, N. Carpita, **C.J. Staiger**

2:20 232. Real-time imaging of cellulose microfibril and biosynthesis. **S. Ding**

2:45 Intermission.

3:00 233. Understanding the mechanism of (1,3;1,4)- β -D-glucan synthesis in cereals. **M. Doblin**, Y. Ho, D. Oehme, M.P. Bain, K. Ford, A.M. van de Meene, E.R. Lampugnani, A. Bacic

3:25 234. Characterizing and utilizing CSLF6 to improve MLG synthesis. **S. Kim**, S. Zemelis-Durfee, K. Keegstra, F. Brandizzi

Section D

Moscone Center
272

Nanocellulose Processing & Analysis | Fundamentals

Cosponsored by AGFD, ANYL, CHAS and I&EC
Financially supported by TAPPI, CelluForce Inc., FPInnovations
M. Bortner, T. Lindström, M. Roman, *Organizers*
W. Y. Hamad, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 235. Cellulose bio-inspired hierarchical structures. **S. Vignolini**, R. Parker, B. Frka-Petescic, G. Guidetti

1:30 236. Driving forces for cellulose nanocrystal alignment in drying droplets: Center versus edge. F. Navarro Arzate, **C. Pritchard**, M. Bortner, **M. Roman**

1:55 237. *In-situ* small angle X-ray scattering of a levitated cellulose nanocrystal droplet. **Y. Liu**, M. Agthe, A. Fall, G. Salazar-Alvarez, C. Schütz, L. Bergstrom

2:20 238. *In situ* Rheo-SAXS study of cellulose nanocrystals suspensions. A. De Geyer, C. Rey, N. Hengl, E. GICQUEL, J. Bras, **B.R. Jean**, F. Pignon

2:45 Intermission.

3:00 239. Effect of the size of the charged group on the properties of alkoxyated NFCs. **a. naderi**, T. Larsson, J. Stevanic Srndovi, T. Lindström, J. Erlandsson

3:25 240. Interaction of β -(1-4) xylan with cellulose surface in biomimetic reconstructed models. L. Falcoz-Vigne, Y. Ogawa, V. Meyer, M. Petit-Conil, k. Mazeau, Y. Nishiyama, **L. Heux**

3:50 Concluding Remarks.

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | Modification & Analytics

Cosponsored by CARB and COLL

Financially supported by EPNOE

M. K. Ek, T. Nypelo, S. Peresin, S. Spirk, *Organizers*

E. Filpponen, *Organizer, Presiding*

R. Kargl, *Presiding*

1:05 241. Periodate oxidation and chemical modifications of cellulosic backbone. **J. Leguy**, Y. Nishiyama, L. Heux, B.R. Jean

1:30 242. Designer molecules for one-step modification of cellulosic materials in aqueous and organic media through the triazine chemistry. **A. Fatona**, R.M. Berry, M.A. Brook, J. Moran-Mirabal

1:55 243. Dissolution of cellulose in NaOH/zinc nitrate at low temperature. **A. Lyu**

2:20 244. Withdrawn

2:45 Intermission.

3:00 245. Topochemical modification of nanocellulose in ionic liquids or gamma-valerolactone. T. Laaksonen, **A. King**, J.K. Helminen, L. Lemetti, D. Rico del Cerro, I. Filpponen, M. Kemell, S. Heikkinen, I. Kilpeläinen

3:25 246. Essential analytical approaches to characterization of lignin specifically targeting the abundant oligomeric fraction observed following a hydrotreatment. **A. Kubatova**, A. Andrianova, J. Kreft, K. Voeller, J. Schumaker, E.I. Kozliak, I.P. Smoliakova

Moscone Center
276

Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

M. L. Auad, J. Campos-Teran, *Organizers*

O. J. Rojas, *Organizer, Presiding*

M. Ago, *Presiding*

1:00 Introductory Remarks.

1:05 247. Silylated lignin and copolymers with acrylonitrile: Flexible membranes and material precursors. **S. LI**, w. Xie, M. Wilt, J.A. Willoughby, O.J. Rojas

1:30 248. Grafting-from cellulose via photoinduced Cu-mediated reversible deactivation radical polymerisation. **F. Hatton**, S.A. Kedzior, E. Larsson, E.D. Cranston, A.E. Carlmark

1:55 249. Valorization of lignin in 0D and 1D advanced systems: Particles for emulsification and fibers for energy storage. **M. Ago**, T. Kämäräinen, B. Tardy, S. Huan, M. Borghei, J.S. Haataja, J. Raula, E.I. Kauppinen, O.J. Rojas

2:20 250. Synthesis, properties and carbonization of different types of ligneous aerogels. **E. Budjav**, S. Quraishi, m. ghorbani, j. Konnerth, C. Unterweger, F. Liebner

2:45 Intermission.

3:00 251. Fiber-based foams for papermaking. **W. Xiang**, I. Filpponen, E. Saharinen, K. Salminen, T. Lappalainen, O.J. Rojas

3:25 252. Towards a better understanding of alkali-lignins isolated from three kinds of non-woody materials. **F. Yue**, F. Lu, R. Sun, J. Ralph

Science for a Sustainable Energy Future

Chemical & Biological Conversions Approaches to Energy Conversion

Sponsored by PRES, Cosponsored by BIOL, BIOT, BMGT, CARB, CATL, CEI, CELL, COLL, ENVR, GEOC, I&EC, MEDI, MPPG[‡], ORGN and PROF

Carbohydrate-Based Hybrid Materials for Nanomedicine

Sponsored by CARB, Cosponsored by CELL

MONDAY EVENING

Section A

Moscone Center
Hall D

Sci-Mix

M. Roman, *Organizer*

8:00 - 10:00

40, 43, 44, 45, 60, 97, 98, 99, 100, 101, 106, 108, 109, 110, 112, 114, 115, 116, 118, 121, 124, 125, 129, 134, 135, 137, 138, 139, 140, 142, 146, 148, 149, 154, 159, 162, 164, 165, 167, 177, 203, 206, 215, 233, 242, 244, 251. See Previous Listings.

262, 263, 299, 347, 351, 528. See Subsequent Listings.

TUESDAY MORNING

Section A

Moscone Center
252/260

Design & Control in Polysaccharide Chemistry: Anselme Payen Award Symposium in Honor of Kevin J. Edgar

Novel Derivatives for Demanding Applications

Cosponsored by CARB

Financially supported by EPNOE, Eastman Chemical Company, VT Fralin Life Science Institute, VT College of Natural Resources and Environment, VT Department of Sustainable Biomaterials, Carbohydrate Polymers (Elsevier)

C. M. Buchanan, P. E. Fardim, *Organizers*

O. J. Rojas, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 253. Control of optical anisotropy of cellulose derivatives. **M. Yamaguchi**, H. Shimada, K. Songsurang

8:30 254. Design of optical films for liquid crystalline displays by control of cellulose ester structure. **C.M. Buchanan**, N. Buchanan, E. Guzman-Morales, B. Wang

8:55 255. Nano- and micropatterns of cellulose - from lithography to microphase separation. K. Niegelhell, H. Plank, F. Stelzer, R. Kargl, T. Griesser, **S. Spirk**

9:20 256. Photo- and biodegradable thermoplastic elastomers containing cellulose and polylactide. **J.B. Matson**, K.J. Arrington

9:45 Intermission.

10:00 257. Heterogeneous catalysts for the regioselective modification of cellulose. **S. Renneckar**, S.C. Patankar

10:25 258. Control of cellulose chiral nematic structure. **D.G. Gray**

10:50 259. Looking at the unwanted acetylation of polysaccharides by 1,3-dialkylimidazolium acetate ionic liquids: Analysis, acetylating agent, influence of water, and mechanistic considerations. **T. Rosenau**, A. Potthast, M. Laborie, T. Zweckmair, H. Hettegger, M. Bacher, H. Abushammala

11:15 260. Peptide-cellulose conjugates for protease point of care diagnostics and treatment. **V. Edwards**, K.R. Fontenot, N.T. Prevost, F. Liebner, A.D. French, D. Haldane, N. Pircher, B.D. Condon

Section B

Moscone Center
262

Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE

P. R. Navard, *Organizer*

J. R. Barone, *Organizer, Presiding*

L. Averous, *Presiding*

8:05 261. New biobased and sustainable epoxy and polyurethane materials and foams from vegetable and microalgal oil. **S. Caillol**

8:30 262. Polylactide/ZnO nanocomposites: From improved functional properties for packaging to novel materials for biomedicine. **E. Lizundia**, J.L. Vilas

8:55 263. Green composites from hemp fibers and styrene-free soybean oil-based thermosets: Preparation and modification. W. Liu, **R. Qiu**

9:20 264. Thermal superinsulating silica aerogels and xerogels reinforced with short cellulose fibers. G. Markevicius, J. Jaxel, P. Niemeyer, R. Ladj, A. Rigacci, **T. Budtova**

9:45 Intermission.

10:00 265. Biopolymer-based multilayer nanocoatings that exhibit high gas barrier and flame retardant behavior. **J.C. Grunlan**

10:25 266. Withdrawn

10:50 267. Comparative studies on miscibility and intermolecular interaction for cellulose ester blends with vinyl copolymers. **K. Sugimura**, Y. Nishio

11:15 268. Sustainable polymeric materials via strategic assemblies of renewable platform chemicals. **J.M. Sadler**, J.F. Stanzione, G.R. Palmese, J.J. La Scala

Moscone Center
270

Cellulose Structure & Biosynthesis | Biochemistry & Cellular Biology

Cosponsored by BIOL, BIOT, CARB and ENFL
Financially supported by Department of Energy - Office of Science
D. Cosgrove, P. Langan, H. M. O'Neill, J. Zimmer, *Organizers*
N. Carpita, *Organizer, Presiding*
M. Doblin, *Presiding*

8:00 Introductory Remarks.

8:05 269. Characterization of *Arabidopsis* CSLD cell wall synthase activities both *in vitro* and *in vivo*. G. Bak, F. Gu, J. Combs, M. Pena, B. Urbanowicz, **E. Nielsen**

8:30 270. Golgi-localized STELLO proteins regulate the assembly and trafficking of cellulose synthase complexes. Y. Zhang, N. Nikolovski, M. Sorieul, T. Vellosillo, H. McFarlane, R. Dupree, C. Driemeier, J. Mortimer, S.P. Brown, S. Persson, **P. Dupree**

8:55 271. Sphingolipid glycosylation in plants: Some implications for cellulose biosynthesis. L. Fang, B. Jing, T. Ishikawa, E. Rennie, H.V. Scheller, **J.C. Mortimer**

9:20 272. Functional differences between CESA protein classes. **S. Turner**, M. Kumar, L. Mishra

9:45 Intermission.

10:00 273. Brassinosteroids regulate cellulose biosynthesis in *Arabidopsis thaliana* by direct phosphorylation. **I.S. Wallace**, K.J. Ketelaar, C. Sanchez-Rodriguez, R. Schneider, J.A. Villalobos, C.R. Somerville, S. Persson

10:25 274. Ultrastructure of spruce secondary wall outer layers. **M. Reza**, C. Bertinetto, J. Ruokolainen, T. Vuorinen

10:50 275. Investigating inter-fibrillar distance between crystalline cellulose microfibrils in plant cell walls using sum frequency generation vibrational spectroscopy. **A. Makarem**, D. Sawada, H.M. O'Neill, S.H. Kim

11:15 276. Bacterial cellulose: Self-assembly and reformatting. **S. Lim**

Moscone Center
272

Developments in the Fields of Celluloses & Lignocelluloses: In honor of Dr. Rajai Atalla

Cosponsored by AGFD, ANYL and POLY

Financially supported by HORIBA Instruments Incorporated; University of Tokyo, Japan;
Inventia AB; U.S. Forest Service

U. P. Agarwal, T. J. Elder, A. Isogai, T. Larsson, *Organizers*

A. D. French, T. Rosenau, *Presiding*

8:00 Introductory Remarks.

8:05 277. Evolving models of lignocellulose structure: Do we need a plant cell wall interactome.
W.T. Winter

8:30 278. Chain polarity in polymorphic unit cells of cellulose, amylose, and chitin. **S.H. Kim**

8:55 279. Enzymatic oxidation of carbohydrates: New applications and new paradigms for
lignocellulose deconstruction. **C. Felby**, K.B. Møllers, D. Cannella

9:20 280. ¹³C NMR method for characterization of partially dissolved cellulose in aqueous
media. **D. Topgaard**

9:45 Intermission.

10:00 281. Disordered structures in plant cellulose microfibrils in terms of leveling-off DP and
layer-by-layer surface peeling of microfibrils. **A. Isogai**

10:25 282. Multifunctional cellulose derivatives for surface modification – an innovative
nanostructural approach. **T.J. Heinze**, P.E. Fardim

10:50 283. Fire protection of cellulose materials, procedures and mechanisms. **L. Wagberg**, M.
Ghanadpour, O. Koklukaya, F. Carosio

11:15 284. Use of Raman microscopy in elucidating the structure of cellulose. **F. Adar**

Moscone Center
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Functional Lignocellulosics & Nanotechnology | Tuning Interfacial Phenomena with Ligno-Nanocellulosic Materials

Cosponsored by CARB and COLL

Financially supported by EPNOE

M. K. Ek, E. Filpponen, T. Nypelo, S. Peresin, S. Spirk, *Organizers, Presiding*

8:05 285. Nanoscale self-assembling properties of hybrid materials obtained from hemicelluloses oligomers and fatty acids in polar and non-polar media. **D. Da Silva Perez**, M. Chemin, J. Russelgong, H. Cramail, S. Grelier

8:30 286. Xyloglucan functional block-copolymers: A modular platform for cellulose modification. F. Hatton, J. Engström, J. Forsling, E.E. Malmstrom, M. Ruda, F. D'Agosto, M. Lansalot, **A.E. Carlmark**

8:55 287. Spruce galactoglucomannans stabilize emulsions against physical breakdown and lipid oxidation. **K. Mikkonen**, M. Lehtonen, D. Merger, U. Van der Schaaf, P. Kilpeläinen, C. Xu, c. berton, M. Wilhelm, K. Schroën

9:20 288. Parametric analysis and mechanism of dispersion of single-walled and multi-walled carbon nanotubes by cellulose nanocrystals. J. Mougel, B. Patricia, I. Capron, **B. Cathala**, O. Chauvet

9:45 Intermission.

10:00 289. Exclusive surface modification of cellulose nanopapers by adsorption of polymers from non-aqueous solvents. **K.S. Kontturi**, K. Biegaj, A. Mautner, R.T. Woodward, B.P. Wilson, K. Lee, J. Heng, A. Bismarck, E. Kontturi

10:25 290. New insights on the effects of chemical structure on the properties of cellulose nanofibrils: Characterization, mechanical performance and barrier properties. **V. Lopez Duran**, P.A. Larsson, L. Wågberg

10:50 291. Tannic acid – A transformative additive when combined with cellulose nanocrystals: From hydrophobic nanoparticles to dried oil powders. **E.D. Cranston**, Z. Hu, R.H. Pelton

11:15 292. Cellulose nanoparticles stabilized in a hydrophobic polymer matrix through synthetic functionalization. B. Teipel, R. Vano, M. Kirby, B. Zahner, E. Teipel, **N. Nagabandi**, K. Holder, M. Akbulut

Moscone Center
276

Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

M. L. Auad, J. Campos-Teran, *Organizers*

O. J. Rojas, *Organizer, Presiding*

G. Toriz Gonzalez, *Presiding*

8:00 Introductory Remarks.

8:05 293. Dissolution and processing of lignocellulose using an ionic liquid solvent: Towards the production of high performance materials. **M. Hummel**, S. Hellsten, S. Asaadi, Y. Ma, E. Walger, S. Haslinger, H. Sixta

8:30 294. Enzymatically produced lignosulfonate based paper coatings for substitution of petroleum based additives. **A. Ortner**, K. Hofer, S. Kopacic, g. nyanhongo, W. Bauer, G.M. Guebitz

8:55 295. Surface wrinkling phenomena in spherical lignin nano- and micro-particles obtained by aerosol flow synthesis. **T. Kämäräinen**, M. Ago, B. Tardy, J. Seitsonen, O.J. Rojas

9:20 296. Wood waste: Resource of biopolymers and high value materials. **L. Couret**, B. Cathala, E. Bonnin, C. Belloncle, M. Irle

9:45 Intermission.

10:00 297. Valorization of lignin and cellulose in acid-steam-exploded corn stover by a moderate alkaline ethanol post-treatment based on an integrated biorefinery concept. S. Yang, **T. Yuan**, R. Sun

10:25 298. Functional materials from spruce hemicelluloses: Crosslinkable xylans and glucomannans. **G. Toriz Gonzalez**, A. Escalante, P. Gatenholm, K. Markstedt

10:50 299. Withdrawn

LPS: Chemistry, Synthesis & Applications

Sponsored by CARB, Cosponsored by CELL

Carbohydrate-Based Hybrid Materials for Nanomedicine

Sponsored by CARB, Cosponsored by CELL

Biomass & Biofuel Processing

Sponsored by ENFL, Cosponsored by CELL, MPPG[‡] and WCC

TUESDAY AFTERNOON

Section A

Moscone Center
252/260

Design & Control in Polysaccharide Chemistry: Anselme Payen Award Symposium in Honor of Kevin J. Edgar | Novel Derivatives for Demanding Applications

Cosponsored by CARB

Financially supported by EPNOE, Eastman Chemical Company, VT Fralin Life Science Institute, VT College of Natural Resources and Environment, VT Department of Sustainable Biomaterials, Carbohydrate Polymers (Elsevier)

P. E. Fardim, O. J. Rojas, *Organizers*

C. M. Buchanan, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 300. Olefin cross-metathesis: Mild, efficient and modular pathway to a new world of polysaccharide derivatives for drug delivery applications. **Y. Dong**, L.I. Mosquera-Giraldo, L. Taylor, K.J. Edgar

1:30 301. Overview of TEMPO-mediated oxidation of polysaccharides. **A. Isogai**

1:55 302. Synthesis, properties, and applications of cellulosic diblock copolymers. **H. Kamitakahara**

2:20 303. Self-healing materials from cellulose. **G. Wenz**, D. Hafner

2:45 Intermission.

3:00 304. Oxidative enzymes - route to functional polysaccharides. **M. Tenkanen**, A. Ghafar, I. Nikkilä, K. Parikka, K. Mikkonen

3:25 305. Functionalized and sequence-defined polysaccharides by glycosynthase-catalyzed polymerization. **A. Planas**

3:50 306. Design and control in polysaccharide chemistry. **K.J. Edgar**

Moscone Center
262

Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE

P. R. Navard, *Organizer*

J. R. Barone, *Organizer, Presiding*

J. Bras, *Presiding*

1:05 307. Comparison of biobased multiphase systems based on different thermoplastic polysaccharides (starch, chitosan and alginate) obtained by thermomechanical mixing. **L. Averous**, E. Pollet

1:30 308. Melt processing of functional protein/polymer blends. **J.K. Pokorski**, P. Lee

1:55 309. Compression molded composites from waste polyester and cotton textiles. H. Xu, M. Palakurthi, L. Xu, **Y. Yang**

2:20 310. Crucial role of processing regimes and compatibilization for toughening highly lignin filled polyethylene blends. **J. Ganster**, J. Erdmann

2:45 Intermission.

3:00 311. Morphological and structural investigation of cellulose I and II nanocrystals. W. Flauzino Neto, J. Putaux, M. Mariano, Y. Ogawa, H. Otaguro, D. Pasquini, **A. Dufresne**

3:25 312. Thin ply bacterial cellulose-reinforced polylactide nanocomposites. **M. Hervy**, F. Bock, K. Lee

Moscone Center
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Advances in Polysaccharides: Practice & Applications | New Developments in the Industrial Sector

Cosponsored by AGFD, CARB, MPPG[‡], PMSE and POLY

A. Biswas, H. Cheng, *Organizers*

H. Cheng, *Presiding*

1:00 Introductory Remarks.

1:05 313. New family of cellulosic excipients for poorly-soluble actives. **R.L. Sammler**, T. Chatterjee, W. Porter, K. O'Donnell

1:30 314. New understanding of syneresis in cellulose ether hydrogels. **C.E. Mohler**, R.L. Sammler, T. Sanders Jr, B. Huebner-Keese, J.D. Moore, T. Boomgaard

1:55 315. Development of extrudable derivatives of Hypromellose Acetate Succinate (HPMC-AS) polymer excipient for use in drug solubilization enhancement. **T.A. Brugel**, F.J. Kolpak, S.K. Sahoo, Q. Schwing, D. Tewari

2:20 316. Bacterially derived medical devices: How commercialization of cellulose requires redefining standard industrial practice. **W. Czaja, D. Inselman, E. Shwarz**

2:45 Intermission.

3:00 317. Development of cellulose-based bioplastic featuring high optical characteristics of traditional Japanese lacquerware: Urushi black bioplastic. **K. Toyama**, M. Iji, Y. Shimode, H. Hamada

3:25 318. New approaches to measure domain sizes in multi-component cellulosic derivatives using NMR. **S. Schantz**, J. Schlagnitweit, M. Tang, M. Baias, A.J. Rossini, S. Richardson, L. Emsley

Section D

Moscone Center
272

Developments in the Fields of Celluloses & Lignocelluloses: In honor of Dr. Rajai Atalla

Cosponsored by AGFD, ANYL and POLY

Financially supported by HORIBA Instruments Incorporated; University of Tokyo, Japan; Innventia AB; U.S. Forest Service

U. P. Agarwal, A. Isogai, T. Larsson, *Organizers*

T. J. Elder, *Organizer, Presiding*

W. T. Winter, *Presiding*

1:00 Introductory Remarks.

1:05 319. Monitoring structural changes during fibrillation of cellulose pulp into cellulose nanofibrils. J. Mao, B. Heck, H. Abushammala, G. Reiter, **M.G. Laborie**

1:30 320. Use of *in vitro* biosynthetic systems to understand cellulose formation and properties. **V. BULONE**

1:55 321. Structure-property relationships of nanocellulose fibrils. **G. Nyström**

2:20 322. Withdrawn

2:45 Intermission.

3:00 323. Changes in the supra-molecular structure of cellulose I during TEMPO-oxidation. Bringing together NMR, MD, and XRD results. **T. Larsson**, J. Wohler, M. Bergenstråhle

3:25 324. Mechanical performance of CNF films revealed by Raman spectroscopy. **S.J. Eichhorn**, T. Tammelin, N. Wanasekara, A. Lewandowska, V. Kunnari, T. Kalijunen

Section E

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | Dispersions, Gels, Foams, Colloids & Films

Cosponsored by CARB and COLL

Financially supported by EPNOE

M. K. Ek, E. Filpponen, S. Peresin, S. Spirk, *Organizers*

T. Nypelo, *Organizer, Presiding*

A. King, *Presiding*

1:05 325. Structural evaluation of cellulose-coated oil-in-water emulsions formed from solution. **Y. Cohen**, S. Napso, G. Alfassi, H. Miyamoto, D. Rein, R. Khalfin

1:30 326. Organisation of cellulose ester monolayers on solid substrates upon Langmuir-Schaefer deposition. **E. Niinivaara**, B.P. Wilson, A. King, E. Kontturi

1:55 327. Photo-induced thiol-ene functionalization towards superhydrophobic and slippery lubricant-infused nanocellulose films. **J. Guo**, W. Fang, A. Welle, W. Feng, E. Filpponen, O.J. Rojas, P. Levkin

2:20 328. Effect of cellulose nanocrystal chirality on the stereochemistry of surface-tethered polymers. **J.O. Zoppe**, A.V. Dupire, H.A. Klok

2:45 Intermission.

3:00 329. Tailoring the surface wettability of cellulose paper/nanopaper via photo-induced click reactions. J. Guo, L. Johansson, **E. Filpponen**, P. Levkin, O.J. Rojas

3:25 330. Nanocellulose as rheology modifier of drilling fluids – Thermostability of nanocellulose dispersions. **K. Syverud**, E. Heggset, G. Chinga-Carrasco

Section F

Moscone Center
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Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD
M. L. Auad, J. Campos-Teran, *Organizers*
O. J. Rojas, *Organizer, Presiding*
C. G. Hunt, *Presiding*

1:00 Introductory Remarks.

1:05 331. Potential use of pulp and paper industry side streams in composites. **L. Wikström**, J. Keränen

1:30 332. Experimental test of limited oxidant diffusion mechanism of decay resistance in acetylated wood. **C.G. Hunt**, S. Lacher, K. Hirth, L. Lorenz, E. Englund Thybring, S.L. Zelinka

1:55 333. Biocatalytic films based on lignin, cationic polymers and immobilized lipase layers. **M.H. Sipponen**, T. Leskinen, J. Valle-Delgado, M.K. Österberg

2:20 334. Identification of accumulated carbohydrate degradation products during the processing of cellulose using an ionic liquid solvent: Towards solvent recycling. **E. Walger**, S. Hellsten, J. Witos, S. Wiedmer, M. Hummel, H. Sixta

2:45 Intermission.

3:00 335. Industrial biorefinery of lignocellulose for production of biomaterials in China. **R. Sun**

3:25 336. Wood component separation by dilute acid prehydrolysis with *p*-cresol. **H. Tomoyuki**, H. Nonaka

LPS: Chemistry, Synthesis & Applications
Sponsored by CARB, Cosponsored by CELL

Biomass & Biofuel Processing
Sponsored by ENFL, Cosponsored by CELL, MPPG[‡] and WCC

WEDNESDAY MORNING

Section A

Moscone Center
252/260

Bio-based Gels & Porous Materials | Biopolymer Hydrogels

Cosponsored by AGFD, CARB, COLL, PMSE and POLY
Financially supported by EPNOE

T. Budtova, F. Liebner, *Organizers*
N. Abidi, R. Sun, *Presiding*

8:00 Introductory Remarks.

8:05 337. Insight into mild condition dissolution of high molecular weight cellulose in ionic liquid based solvent system. S. Acharya, Y. Hu, **N. Abidi**

8:30 338. Soft gelation of cellulose/DMAc/LiCl solution. **R. Liu**, C. Zhang, J. Xiang, H. Kang, Y. Huang

8:55 339. Cellulose gels and cryogels via physical and chemical cross-linking. D. Ciolacu, C. Rudaz, M. Vasilescu, **T. Budtova**

9:20 340. New cellulosic sponge and foam made from cellulose fibers through a simple freezing/thawing method. **A. Tejado**, A. Aramburu, Y. de Miguel

9:45 Intermission.

10:00 341. Rheological behavior of thermosensitive hydrogel suspensions based on Cellulose Nanocrystals with adsorbed thermo-responsive polymer. **E. GICQUEL**, B. JEAN, J. Engström, C. MARTIN, A.E. Carlmark, J. Bras

10:25 342. Nanocellulose based electrospun membranes for water purification: Tailoring of porosity and functionality. **A. Mathew**

10:50 343. Robust, dynamic hydrogels with modified cellulose nanocrystals as crosslinkers. **K. Zhang**

11:15 344. Lignin-based hydrogels with super-swelling capacities. **J. Domínguez-Robles**, A. Jaaskelainen, A. Rodríguez, T. Tamminen, T. Litiä, E. Larrañeta, M.S. Peresin

Section B

Moscone Center
262

Processing & Properties of Biobased Composites & Blends

Financially supported by EPNOE
J. R. Barone, P. R. Navard, *Organizers, Presiding*

8:05 345. Potential of cellulosic nanocomposites materials from cassava pulp. **K. Kasemwong**, K. Piyachomkwan

8:30 346. Various shapes of chitosan based nanocomposites and their hemostatic ability. **Y. Bao**, S. Wu, X. Shi, H. Deng, **Y. Du**

8:55 347. Degradation kinetics of compression-molded date pits composites. **A. Mohamed**, S. Hussain, M. Alamri

9:20 348. Withdrawn.

9:45 Intermission.

10:00 349. Cotton-based cellulose nanomaterials for applications in composites and electronics. N. Farahbakhsh, **R.A. Venditti**, J. Jur

10:25 350. Interfacial thickness for tailoring the reinforcing properties of nanocellulose in polymer matrix. **H. Soeta**, T. Saito, A. Isogai

10:50 351. Transparent, macro to nano moldable composites reinforced by cellulose nanofibers. **S.K. Biswas**, H. Yano

11:15 352. Functional cellulose nanocrystal reinforcing fillers in polymer nanocomposite films. **J.A. Sirviö**, M. Visanko, J.P. Heiskanen, H. Liimatainen

Section C

Moscone Center
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Advances in Polysaccharides: Practice & Applications | Novel Biocatalytic & Biopolymeric Approaches

Cosponsored by AGFD, CARB, MPPG[‡], PMSE and POLY

A. Biswas, H. Cheng, *Organizers*

G. W. Selling, *Presiding*

8:05 353. Chemo-enzymatic synthesis and functional properties of well-defined human milk oligosaccharides. **G. Boons**

8:30 354. Chemo-enzymatic synthesis of homogeneous hyaluronan polysaccharides and their biological applications. J. Fang, **P.G. Wang**

8:55 355. Chemoenzymatic synthesis of carbohydrates and glycoconjugates. **X. Chen**

9:20 356. Structure and property of new dextrans obtained by enzymatic synthesis. **P. Faucard**, F. Grimaud, A. Rolland-Sabaté, M. Remaud-Siméon, G. Potocki-Véronèse, D. Lourdin

9:45 Intermission.

10:00 357. Enzymatic production of oligosaccharides and polysaccharides for food ingredient applications. **R. DiCosimo**

10:25 358. Synthesis of well-defined unnatural polysaccharides by phosphorylase-catalyzed enzymatic polymerization. **J. Kadokawa**

10:50 359. Combined enzymatic-ionic liquid treatments to increase the accessibility and reactivity of pulp fibers. **R. Wahlström**, J. Rahikainen, K. Kruus, A. Suurnäkki

11:15 360. Dendrimer-like biopolymers: A new arena for biomaterial development. **Y. Yao**

Section D

Mosccone Center
272

Developments in the Fields of Celluloses & Lignocelluloses: In honor of Dr. Rajai Atalla

Cosponsored by AGFD, ANYL and POLY

Financially supported by HORIBA Instruments Incorporated; University of Tokyo, Japan; U.S. Forest Service

T. J. Elder, A. Isogai, T. Larsson, *Organizers*

U. P. Agarwal, *Organizer, Presiding*

O. J. Rojas, *Presiding*

8:00 Introductory Remarks.

8:05 361. Cellulose crystallinity: What does it mean? **M.F. Crowley**, M. Himmel, L. Bu, Y. Zhang, L. Makowski

8:30 362. Visualization of dynamic changing in formation of cell wall cellulose and callose along with arrangements of microtubules with GFP on surfaces of protoplast cells. **T. Kondo**, S. Tagawa

8:55 363. Explicit modeling and underdetermined (scattering) data to approach a complex reality. **Y. Nishiyama**

9:20 364. Folding of xylan onto cellulose fibrils in plant cell walls revealed by solid-state NMR. T.J. Simmons, J. Mortimer, O.D. Bernardinelli, A. Poppler, S.P. Brown, E. Azevedo, R. Dupree, **P. Dupree**

9:45 Intermission.

10:00 365. Cellulose II formation by cellulose synthase: Negative data can make themselves positive?. **T. Imai**, J. Sugiyama

10:25 366. Towards an improved understanding of cellulose swelling, dissolution and regeneration at the molecular level. **T. Rosenau**, A. Potthast

10:50 367. Evolution of our understanding of native celluloses. **R.H. Atalla**

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | Dispersions, Gels, Foams, Colloids & Films

Cosponsored by CARB and COLL

Financially supported by EPNOE

M. K. Ek, E. Filpponen, T. Nypelo, S. Spirk, *Organizers*

S. Peresin, *Organizer, Presiding*

T. J. Elder, *Presiding*

8:05 368. Hydrolysis assisted by hydrogen chloride vapor on different cellulose polymorphs. **E. Kontturi**, E. Niinivaara, S.A. Arshath, A. Bismarck

8:30 369. Crosslinking as a facilitator for novel (nano)cellulose-based applications. **P.A. Larsson**, J. Erlandsson, V. Lopez Duran, J. Henschen, N. Tchang Cervin, Z. Al-Ansari, A.J. Svagan, L. Wagberg

8:55 370. Withdrawn

9:20 371. Oriented all-cellulose film based on ramie fiber with high mechanical property and transparency. **X. Yang**, L. Berglund

9:45 Intermission.

10:00 372. Sample geometry dependency on the measured tensile properties of cellulose nanopapers. M. Hervy, A. Santmarti, P. Lahtinen, T. Tammelin, **K. Lee**

10:25 373. Enzymatic and chemical modification of nanosized colloidal lignin particles. J. Valle-Delgado, T. Leskinen, A. Paananen, M.K. Österberg, **M. Mattinen**

10:50 374. Partial dissolution as a reinforcing chemistry for CNF films. **H. Orelma**, A. Korpela, V. Kunnari, A. Harlin, T. Tammelin, A. Suurnäkki

11:15 375. Water-resistant nanocellulose films with inter-fibrillar interactions via multivalent metal ions. **M. Shimizu**, T. Saito, A. Isogai

Moscone Center
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Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

J. Campos-Teran, O. J. Rojas, *Organizers*

M. L. Auad, *Organizer, Presiding*

J. Lopez-Sanchez, *Presiding*

8:00 Introductory Remarks.

8:05 376. Wood-derived hemicelluloses as green binders in wood adhesives. **L. Fogelström**, E. Norström, J. Holmqvist, S. Pendergraph, J. Brücher, E.E. Malmstrom

8:30 377. Novel thermoset polymeric networks from fast pyrolysis bio-oil. **M.L. Auad**, M. Barde, B. Sibaja

8:55 378. Development of clay-like extrudable wood fiber material. K. Kawamura, K. Takayanagi, **H. Nonaka**

9:20 379. Synthesis and characterization of bio-oil-based self-curing epoxy resin. **Y. Celikbag**, S. Meadows, M. Barde, S. Adhikari, G. Buschle-Diller, M. Auad, B. Via

9:45 Intermission.

10:00 380. Valorization of starchy, cellulosic, and sugary food waste into value-added chemicals. **I. Yu**, D. Tsang

10:25 381. Microcellular foaming of arabinoxylan with scCO₂. **L. Hardelin**, A. Ström, A. Larsson

10:50 382. Transforming biomass to chemicals and fuels with light and catalysis. **J. Lopez-Sanchez**

11:15 383. Agricultural and industrial residues: Cellulose fiber and its nanocrystals. **D. Rosa**, J. Nunes de Macedo, A. Souza

Carbohydrate-Based Nanomaterials & Drug-Delivery Vehicles

Sponsored by CARB, Cosponsored by CELL

Biomass & Biofuel Processing

Sponsored by ENFL, Cosponsored by CELL, MPPG[‡] and WCC

WEDNESDAY AFTERNOON

Section A

Moscone Center
252/260

Bio-based Gels & Porous Materials | Biopolymer Organogels

Cosponsored by AGFD, CARB, COLL, PMSE and POLY

Financially supported by EPNOE

T. Budtova, *Organizer*

F. Liebner, *Organizer, Presiding*

H. Mansur, *Organizer*

1:05 384. Withdrawn

1:30 385. Multifunctional hydrogel dressing material for treatment of chronic wound. **I.S. Stefanov**, S. Pérez-Rafael, T. Tzanov

1:55 386. Hierarchically porous nanocellulose materials for cartilage applications. **N. Naseri, A. Mathew**

2:20 387. Cellulose-based hydrogels with encapsulative cyclooligosaccharides to enhance the efficient release of hardly soluble drugs. **D. Jeong**, S. Joo, S. Jung

2:45 Intermission.

3:00 388. Biomass-derived highly stretchable and elastic hydrogels with effective antimicrobial activity. **Y. Si**, Z. Zheng, G. Sun

3:25 389. Preparation of cellulose and chitin-CdTe quantum dots films and antibacterial effect on *Staphylococcus aureus* and *Pseudomonas aeruginosa*. **P. Wansapura**, N. Abidi, R. Dassanayake, A. Hamood, P. Tran

3:50 390. Cellulose aerogels via self-assembling and electrospinning. F. Jiang, **Y. Hsieh**

4:15 391. Nanocellulose composite hydrogels – Tailoring of mechanical properties of tissue scaffolds. **E. Heggset**, K. Syverud

Section B

Moscone Center
262

Reactive Extrusion: Advances at the Nexus of Polymer Processing, Materials Technology & Green Chemistry | Advanced Materials & Structures

Cosponsored by MPPG[‡] and POLY
L. A. Lucia, *Organizer*
A. Ayoub, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 392. Reactive extrusion of zein with glyoxal and polyethylene maleic anhydride. **G.W. Selling**, K. Utt

1:30 393. Melt-processing of cellulose pulp and polycaprolactone composites: Wet feeding approach to improve the filler dispersion. **G. Lo Re**, S. Spinella, F. Vilaseca, L. Berglund

1:55 394. Reactive extrusion compatibilization of cellulose acetate/water soluble polymer blends. **R. Quintana Vicente**, O. Persenarie, Y. Lemmouchi, L. Bonnaud, P. Dubois

2:20 395. Reactive compatibilizers in the creation of wood fiber plastic composites. **J. Pawlak**, Y. Wang

2:45 Intermission.

3:00 396. Liquid assisted extrusion process of cellulose nanocomposites. **K.A. Oksman**, N. Herrera, A. Singh

3:25 397. New insights in melt processing of cellulose nanomaterial based nanocomposites. **A. Dufresne**

3:50 398. Extrusion technology for nanocomposite containing renewable lignocellulosic materials. **R.A. Venditti**

4:15 399. Processing of (nano)biocomposite foams by continuous supercritical CO₂ assisted extrusion. **N. Le Moigne**, M. Sauceau, M. Chauvet, M. Benyakhlef, E. Rodier, J. Fages

4:40 Concluding Remarks.

Section C

Moscone Center
270

Advances in Polysaccharides: Practice & Applications | Novel Materials & Methodologies

Cosponsored by AGFD, CARB, MPPG[‡], PMSE and POLY
A. Biswas, H. Cheng, *Organizers*
W. J. Orts, *Presiding*

1:05 400. Polysaccharide-surfactant association—basics and applications. **B. Lindman**, T. Nylander, M. Miguel, F. Antunes, F. Cuomo

1:30 401. Creating cost-effective agriculturally-derived nanocomposites for commodity applications. **W.J. Orts**, G.H. Tonoli, G.M. Glenn, K.M. Holtman, L.F. Torres, D.F. Wood

1:55 402. Functional cellulosic arabinoxylan fiber from agricultural biomass. **M.P. Yadav**, R. Moreau, K.B. Hicks, M. Kale

2:20 403. Strategies toward cellulose nanofibers, porous fibers and hybrids. **Y. Hsieh**

2:45 Intermission.

3:00 404. UV-absorbing materials based on natural molecular sunscreens and chitosan. S.C. Fernandes, **V. Bulone**

3:25 405. Higher value films prepared from poly(vinyl alcohol) and amylose-fatty acid derivatives inclusion complexes. **G.W. Selling**, G. Fanta, F.C. Felker, W.T. Hay

3:50 406. Bio-based sources for *p*-xylene. **P.B. Smith**, D.R. Henton, A. Dumitrascu, D.A. Hucul, M. Masuno, R. Smith, J. Bissell

4:15 407. Chemical platform for the production of Bio-PET. **R. Smith**

Section D

Mosccone Center
272

Developments in the Fields of Celluloses & Lignocelluloses: In honor of Dr. Rajai Atalla

Cosponsored by AGFD, ANYL and POLY

Financially supported by HORIBA Instruments Incorporated; University of Tokyo, Japan; Innventia AB; U.S. Forest Service

U. P. Agarwal, T. J. Elder, A. Isogai, T. Larsson, *Organizers*

M. G. Laborie, N. Robitaille Brown, *Presiding*

1:00 Introductory Remarks.

1:05 408. Single-sourced nanocelluloses: Process-linked characteristics and behaviors. **Y. Hsieh**

1:30 409. Interactions between cellulose and random and block copolymers: Antifouling and friction. M. Vuoriluoto, H. Orelma, L. Johansson, **O.J. Rojas**

1:55 410. Conformational energy distribution for crystals of cellobiose and analogs. **A.D. French**

2:20 411. Three-dimensional alignment of lamella single crystals of cellulose II using magnetic field. **M. Wada**, S. Wakiya, K. Kobayashi, S. Kimura, M. Kitaoka, R. Kusumi, F. Kimura, T. Kimura

2:45 Intermission.

3:00 412. New model for untangling cellulose ultrastructure. **U.P. Agarwal**

3:25 413. Dynamic FTIR as a tool to assess the interaction of lignin in wood pulps. **L. Salmén**

3:50 414. Modeling the mesoscale architecture of lignocellulose to elucidate its impact on transport phenomena and biomass conversion processes. **P.N. Ciesielski**, M.F. Crowley, B.S. Donohoe, M. Himmel

4:15 415. Chemical microscopy of polysaccharide surfaces using TOF-SIMS. **P.E. Fardim**

Section E

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | Responsive Materials & Biosensors

Cosponsored by CARB and COLL
Financially supported by EPNOE
M. K. Ek, T. Nypelo, S. Peresin, *Organizers*
E. Filpponen, S. Spirk, *Organizers, Presiding*

1:05 416. Investigation of the thermodynamics of the interaction of (modified) cellulose nanocrystals with natural polymers. **W. Thielemans**

1:30 417. Cellulose-inorganic hybrid structures as promising thermoelectric materials. **T. Tammelin**, M. Gestranus, M. Putkonen, B.P. Wilson, M. Karppinen, E. Kontturi

1:55 418. Nanocellulose mediated layer-by-layer chip modification for cellular *in-vitro* diagnostics. **T. Pettersson**, H. Ramachandraiah, A. Russom

2:20 419. Multi-layered polysaccharide based nanofilms for the treatment of chronic venous ulceration. J. Stana, J. Stergar, L. Gradišnik, R. Kargl, V. Flis, T. Mohan, **K. Stana Kleinschek**, U. Maver

2:45 Intermission.

3:00 420. Graft modification of cellulose nanocrystals with carbon dioxide responsive polymers via living radical polymerization. O. Garcia-Valdez, J. Arredondo, P.G. Jessop, P. Champagne, J. Bouchard, **M.F. Cunningham**

3:25 421. Quantitative modelling of water transport in ultrathin cellulose nanofibril films. **M. Hakalahti**, E. Kontturi, T. Tammelin

3:50 422. Impact of water vapor adsorption on physically treated cellulose thin films. **D. Reishofer**, R. Resel, G. Drexler, W. Fischer, T. Tammelin, E. Kontturi, **S. Spirk**

4:15 423. Elaboration of cellulose nanocrystals CNC/Ge-imogolites multilayered thin films. **C. Mauroy**, C. Levard, C. Moreau, B. Cathala, J. Rose

Section F

Moscone Center
276

Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

M. L. Auad, O. J. Rojas, *Organizers*

J. Campos-Teran, *Organizer, Presiding*

G. Toriz Gonzalez, *Presiding*

1:00 Introductory Remarks.

1:05 424. Withdrawn

1:30 425. Valorization of industrial biomass ash in structural materials. **H. Uvegi**, P. Chaunsali, R. Osmundsen, J. Ochsendorf, E. Olivetti

1:55 426. Adsorption and viscoelastic studies of gold Nanoparticles (NPAu) and Bovine Serum Albumin (BSA) complexes at chitosan-alginate-cellulose films. D. Gómez-Maldonado, R. López-Simeon, A. Topete, **J. Campos-Teran**

2:20 427. Withdrawn.

2:45 Intermission.

3:00 428. Reactive film-forming maleimido dextrans for cysteine-containing surfaces adsorbing BSA. T. Elschner, F. Obst, T.J. Heinze, **R. Kargl**, K. Stana Kleinschek

3:25 429. Morphological and thermo-chemical changes upon autohydrolysis and microemulsion treatments of coir and EFB residual biomass to isolate lignin-rich Micro and Nano Fibrillar Cellulose (MNFC). **A. Tripathi**, A. Ferrer, S.A. Khan, O.J. Rojas

3:50 430. Effect of cellulose nanofibril morphology on the strength and stiffness of macroscopic filaments. **N. Mittal**, T. Kaldeus, F. Lundell, D. Soderberg

4:15 431. Role of lignin on functional and physicochemical properties of enzymatic modified soy protein film. **E. Zadeh**, Y. Kim

Moscone Center
130

Frontiers in Glycoanalytics | MS & NMR Methods

Cosponsored by ANYL, CARB[‡] and MPPG[‡]

Financially supported by Agilent Technologies; Bruker BioSpin Corporation; Postnova Analytics, Incorporated; Rigaku Corporation; Waters Corporation; Wyatt Technology Corporation

G. Boons, M. Roman, *Organizers, Presiding*

1:10 Introductory Remarks.

1:15 432. MS techniques in structure analysis of complex glycans. **F. Vilaplana**, A. Martínez-Abad, A. Ruthes

1:55 433. Advancing glycopeptide characterization using high sensitivity HILIC-MS methods. **W. Alley**, Y. Yu, M. Lauber

2:20 434. Infrared spectroscopy integrated to mass spectrometry: An innovative platform for *de novo* carbohydrate sequencing. **I. Compagnon**

2:45 Intermission.

3:00 435. Examining glycan structure and dynamics with NMR: A tutorial. **J.H. Prestegard**

3:40 436. Asparagine-linked glycosylation of immunoglobulin G and the Fc gamma receptors impacts immune system activation. **A.W. Barb**

4:05 437. NMR Analysis of substituent distribution in polysaccharide derivatives. **S. Liu**, K.J. Edgar

4:30 438. Solid-state NMR methods to determine glycan structure, intermolecular interactions and protein binding in plant cell walls. **T. Wang**, P. Phyto, Y. Chen, D. Cosgrove, M. Hong

Carbohydrate-Based Nanomaterials & Drug-Delivery Vehicles

Sponsored by CARB, Cosponsored by CELL

Biomass & Biofuel Processing

Sponsored by ENFL, Cosponsored by CELL, MPPG[‡] and WCC

THURSDAY MORNING

Section A

Moscone Center
252/260

Bio-based Gels & Porous Materials | Aero-, Cryo- & Xerogels

Cosponsored by AGFD, CARB, COLL, PMSE and POLY

Financially supported by EPNOE

F. Liebner, *Organizer*

T. Budtova, *Organizer, Presiding*

C. Freire, *Presiding*

8:05 439. Cellulose nanofiber - towards tailored release of small molecules. **A. Svagan**, L. Wagberg, J. Wohler, A. Mullertz, D. Bar shalom, K. löbmann

8:30 440. Nanocellulose aerogels with thermal superinsulating properties obtained by spray freeze-drying. C. Jiménez-Saelices, B. Saentier, **B. Cathala**, Y. Grohens

8:55 441. Anisotropic cellulose ester aerogels with tunable mechanical properties via controlled solvent exchange. **A. Tripathi**, S.A. Khan, O.J. Rojas

9:20 442. 2,3-Dicarboxyl nano cellulose: A novel source material for transparent, birefringent and thermally superinsulating aerogels. S. Plappert, J. Nedelec, **F. Liebner**

9:45 Intermission.

10:00 443. Functional aerogels based on nanocellulose and platinum nanoparticles/graphene oxide for catalytic applications. R. Pinto, A.A. Silvestre, M. Simões, P. Marques, **C. Freire**

10:25 444. Fabrication of functionalized aerogels from cellulose and whole biomass for absorbing formaldehyde from indoor air. **Y. Liao**, X. Pan

10:50 445. Superhydrophobic nanocellulose-silica composite aerogels for efficient water-in-oil emulsions separation. **S. Zhou**, F. Xu

11:15 446. Cellulose Aerogel Reinforced Polymers (CARPs). **M. Schestakow**, L. Ratke

Section B

Moscone Center
262

Reactive Extrusion: Advances at the Nexus of Polymer Processing, Materials Technology & Green Chemistry | Commercial & Versatile Technology

Cosponsored by MPPG[‡] and POLY
L. A. Lucia, *Organizer*
A. Ayoub, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 447. Twin-screw extrusion: A versatile tool for the pretreatment of biomass. **A. Rouilly**, V. VanDenBossche, P. Evon, M. Rigal

8:30 448. Using reactive extrusion to manufacture greener products – from laboratory fundamentals to commercial scale. **R. Narayan**

9:20 449. Extrusion of protein plastics. M.S. Hedenqvist, E. Johansson, W. Newson, M. Gällstedt, R. Kuktaite, H. Ullsten, H. Türe, **Q. Wu**

9:45 Intermission.

10:00 450. Silicone-based cellulose materials: Processes & characterizations. **E. Fleury**, C. Barres, A. Rachini, X. Zhou, J. BERNARD, S. Deng, A. Charlot

10:25 451. Withdrawn

10:50 452. Thermomechanical extrusion pretreatment for production of ethanol and arabinoxylan from corn fiber. **G. Ryu**

11:15 453. Optimizing high shear and other process parameters for reactive mixing and nanocomposite dispersion. **A. Farahanchi**, B. Calderon, J. Gug, M.J. Sobkowicz

11:40 Concluding Remarks.

Section C

Moscone Center
270

Advances in Polysaccharides: Practice & Applications | New Functional Materials

Cosponsored by AGFD, CARB, MPPG[‡], PMSE and POLY
H. Cheng, *Organizer*
A. Biswas, *Organizer, Presiding*

8:05 454. Design of new functional polysaccharide nanoparticles for biomedical imaging applications. **M. Bozic**, M. Bracic, R. Kargl, U. Jančič, D. Tkaućic, T. Elschner, S. Hribernik, T. Mohan, K. Stana Kleinschek

8:30 455. Chitin-Glucan nanopapers from fungi in membrane and water treatment operations. **A. Mautner**, N. Yousefi, W. Wan Nawawi, A. Bismarck

8:55 456. Cellulose functional materials with multiple stimuli responsive and their applications in sensors. **H. Kang**, P. Li, R. Liu, Y. Huang

9:20 457. Adsorption of IgG antibodies on cellulose thin film surface. **V. Raghuvanshi**, Z. Huang, G. Garnier

9:45 Intermission.

10:00 458. Development of cellulose helicoidal architectures in nature. **S. Vignolini**

10:25 459. Free-standing multilayered membranes from renewable polymers, towards tissue engineering applications. **M.P. Sousa**, F. Cleymand, J.F. Mano

10:50 460. Structural features of polycarboxylic acids as crosslinking agents of cellulose. **G. Sun**, C. Zhao, H. Qi, B. Ji, K. Yan

11:15 461. PEGylation of chitosan via nitroxide chemistry in aqueous media. O. Garcia-Valdez, A. Darabi, M.F. Cunningham, **P. Champagne**

Section D

Moscone Center
272

Developments in the Fields of Celluloses & Lignocelluloses: In honor of Dr. Rajai Atalla

Cosponsored by AGFD, ANYL and POLY

Financially supported by HORIBA Instruments Incorporated; University of Tokyo, Japan; Innventia AB; U.S. Forest Service

U. P. Agarwal, T. J. Elder, A. Isogai, *Organizers*

T. Larsson, *Organizer, Presiding*

Y. Hsieh, *Presiding*

8:00 Introductory Remarks.

8:05 462. New development of wood chemistry promoted by TOF-SIMS. D. Aoki, Y. Matsushita, K. Kuroda, **K. Fukushima**

8:30 463. Following in-situ hydrophobisation of plant cell walls by Raman imaging. **N. Gierlinger**, B. Prats-Mateu, M. Felhofer, P. Bock

8:55 464. On the mechanisms of cellulose dissolution in aqueous media. **B. Lindman**, B. Medronho, L. Alves, M. Norgren, H. Edlund

9:20 465. Construction of cellulose based nanofibrous materials via green route. **L. Zhang**

9:45 Intermission.

10:00 466. Polymerization of cellulose and lignin on a chip: Morphological studies. **N. Robitaille Brown**, S. Basu, O. Omadjela, C. Anderson, Y. Zhu, J.M. Catchmark, J. Zimmer

10:25 467. Crystal deformation and transformation of cellulose allomorphs derived from stability of molecular chain sheets. T. Uto, **T. Yui**

10:50 468. Imaging mass spectrometry analysis of woody cell wall using $^{13}\text{CO}_2$ pulse labeling. **M. Takeuchi**, M. Norisada, A. Isogai

11:15 469. Withdrawn

Section E

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | Responsive Materials & Biosensors

Cosponsored by CARB and COLL
Financially supported by EPNOE
M. K. Ek, T. Nypelo, S. Peresin, *Organizers*
E. Filpponen, S. Spirk, *Organizers, Presiding*

8:05 470. First steps towards bio-based static true volumetric 3D displays: Transparent cellulose scaffolds equipped with photon upconverting rare earth metal doped nanophosphors (uc-NP). **S. Quraishi**, S. Plappert, T. Rosenau, F. Liebner

8:30 471. Phase separated bicomponent biopolymer thin films - enzymatic patterning and protein interaction. **K. Niegelhell**, M. Süßenbacher, K. Jammerneegg, T. Ganner, D. Schwendenwein, H. Schwab, F. Stelzer, H. Plank, **S. Spirk**

8:55 472. Dye functionalized polysaccharide nanoparticles – From synthesis to bio-sensor applications in immunoassays. **P. Schulze**, M. Gericke, F. Scholz, P. Miethe, T.J. Heinze

9:20 473. Cellulose-based microcapsules: Bio-compatible vessels for packing, delivery and attachment of active species. **S. Hribernik**, T. Kos, M. Kurecic, K. Stana Kleinschek

9:45 Intermission.

10:00 474. Withdrawn

10:25 475. Cellulose as a template for generation, wireless transport and storage of electrical energy with conducting polymers. **S. Malti**

10:50 476. Bacterial nanocellulose-based composites as ion exchange membranes for fuel cells. **C. Vilela**, A.A. Silvestre, F.M. Figueiredo, C.S. Freire

11:15 477. Hydrogen bonding and polymer adsorption: A look at polyethylene glycol with cellulose and silica colloids. **M.S. Reid**, H.S. Marway, M. Villalobos, E.D. Cranston

Section F

Moscone Center
276

Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

J. Campos-Teran, O. J. Rojas, *Organizers*

M. L. Auad, *Organizer, Presiding*

R. L. Quirino, *Presiding*

8:00 Introductory Remarks.

8:05 478. Activated polysaccharide nanoparticles derived from xylan phenyl carbonates – From synthesis to applications. **M. Gericke**, L. Gabriel, K. Geitel, P. Trivedi, P.E. Fardim, T.J. Heinze

8:30 479. Emulsion polymerization of tung oil-based latexes with asolectin as a biorenewable surfactant. A. Johns, K. Edwards, S. Inglesby, **R.L. Quirino**

8:55 480. Bioactive nano-coatings from hyaluronic acid and a lysine-derived surfactant. M. Bracic, L. Fras-Zemljic, K. Kogej, **R. Kargl**, K. Stana Kleinschek, T. Mohan

9:20 481. Biomaterials based on polysaccharide conjugates. **R. Kargl**, A. Dobaj Štiglic, T. Mohan, U. Maver, L. Gradišnik, T. Elschner, K. Stana Kleinschek

9:45 Intermission.

10:00 482. Green approaches to preparation of amphiphilic soy protein microfibrils and films. **X. Liu**, Y. Hsieh

10:25 483. Improvement of BC production by a new reclassified acid-resistant strain using food supply chain waste in a two-stage fermentation. **C.A. Molina**, C. Castro Herazo, R. Zuluaga Gallego, P. Gañán

10:50 484. Withdrawn

Section G

Moscone Center
130

Frontiers in Glycoanalytics | Molar Mass & Crystallinity Analyses

Cosponsored by ANYL, CARB[‡] and MPPG[‡]

Financially supported by Agilent Technologies; Bruker BioSpin Corporation; Postnova Analytics, Incorporated; Rigaku Corporation; Waters Corporation; Wyatt Technology Corporation

G. Boons, *Organizer*

M. Roman, *Organizer, Presiding*

8:10 Introductory Remarks.

8:15 485. Separation and characterization of polysaccharides by multi-detection size-exclusion chromatography and field-flow fractionation techniques. **L. Pitkanen**, A.M. Striegel

8:55 486. Determination of thickness, aspect ratio and size distribution of cellulose nanocrystals using asymmetric flow FFF and MALS. **S. Tadjiki**, R. Reed, M. Roman

9:20 487. Benefits of MALS, FFF and Viscometry in the characterization of polysaccharide molar mass, size, conformation and branching ratios. **J.A. Ahlgren**

9:45 Intermission.

10:00 488. Quantitating cellulose crystallinity: Approaches, problems, and perspectives. **W.T. Winter**

10:40 489. Simplified studies of cellulose crystallinity with a Rietveld program. **A.D. French**

11:05 490. Vibrational spectroscopy study of crystalline cellulose – peak assignment, crystallinity, and non-linear optical responses. **S.H. Kim**

11:30 491. Raman spectroscopy in the analysis of cellulose: Addressing the issues of crystallinity, polymorphy, and ultra-structure. **U.P. Agarwal**

THURSDAY AFTERNOON

Section A

Moscone Center
252/260

Bio-based Gels & Porous Materials | Open-Porous Carbon Materials

Cosponsored by AGFD, CARB, COLL, PMSE and POLY

Financially supported by EPNOE

T. Budtova, F. Liebner, *Organizers*

B. Cathala, *Presiding*

1:05 492. Nanocellulose aerogel beads: Structurable and printable energy storage. **J. Erlandsson**, H. Granberg, M. Sandberg, L. Wagberg

1:30 493. 3D interdigitated energy storage devices built inside aerogels using layer by layer assembly. **Z. Wang**, M. Hamed, L. Wagberg

1:55 494. Processing and properties of elastomer covalently bound to nanocellulose aerogel. m. fumagalli, S. Boisseau, **L. Heux**

2:20 495. Functional polysaccharide hydrogels through chemical derivatization of agarose. **M. Gericke**, M. Witzler, M. Schulze, T.J. Heinze

2:45 Intermission.

3:00 496. Withdrawn

3:25 497. Biologically modified lignin for water purification. **I. Brzonova**, C.J. Buelke, E.I. Kozliak, Y. Ji

3:50 498. Preparation of carbon aerogels from TEMPO-oxidized cellulose nanofibers for organic solvents absorption. **M. Wang**

4:15 499. Value-Added biomaterials from lignocellulose based on biorefinery scenario. **R. Sun**

4:40 Concluding Remarks.

Section B

Moscone Center
262

Reactive Extrusion: Advances at the Nexus of Polymer Processing, Materials Technology & Green Chemistry | Energy, Food & Packaging Development

Cosponsored by MPPG[‡] and POLY

L. A. Lucia, *Organizer*

A. Ayoub, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 500. Melt extrusion of lignin carbon-fiber precursors: The path forward for low-cost fibers or unrealizable dream? **D.P. Harper**, O. Hosseinaei

1:30 501. Melt extrusion of acrylonitrile based quad-polymer precursor for green carbon fiber technology. **S. Mahmood**, B.L. Batchelor, M. Jung, H. Song, D. Yang

1:55 502. Rheology and modeling of complex food systems in reactive extrusion. **M. Emin**, H. Schuchmann

2:20 503. Polymerization of sugars by reactive twin-screw extrusion to produce soluble fibers for food and feed. **T.C. Schoenfuss**, A. Kuechel, C. Tyl

2:45 Intermission.

3:00 504. Advanced thermal analysis modelling for the characterization of active poly(lactic acid)/natural fibre food-packaging composite materials. **S.W. Bigger**, M.J. Cran, I.S. Tawakkal

3:25 505. Utilization of coffee wastes in biobased composite materials for food packaging uses. **T. Wang**, N. Zarrinbakhsh, R. Muthuraj, A. Rodriguez-Uribe, S. Vivekanandhan, M. Misra, A. Mohanty

3:50 506. Withdrawn

4:15 507. Preparation of water soluble oligosaccharides from sugar reversion reactions in acidic lithium bromide trihydrate. **N. Li**, X. Pan

4:40 Concluding Remarks.

Section C

Moscone Center
270

Advances in Polysaccharides: Practice & Applications | Preparation, Characterization & Applications

Cosponsored by AGFD, CARB, MPPG[‡], PMSE and POLY
A. Biswas, H. Cheng, *Organizers*
H. Cheng, R. Furtado, *Presiding*

1:05 508. Gradient separations and two-dimensional separations of cellulose derivatives. **W. Radke**

1:30 509. New insight into the gelation of Na-alginate aqueous solution. **R. Liu**, C. Zhao, K. Sui, Y. Xia

1:55 510. Electrospun polysaccharide based materials as modern wound dressings. **M. Kurečić**, U. Maver, T. Maver, T. Pivec, T. Rijavec, A. Lapanje, S. Hribernik, K. Stana Kleinschek

2:20 511. Hemicelluloses cationization: Comparison of liquid and solid phase preparation processes. **D. Da Silva Perez**, V. Bigand, C. Pinel, F. Rataboul, M. Petit-Conil

2:45 Intermission.

3:00 512. Use of polysaccharides from cashew gum in encapsulation applications. **R. Furtado**, L.C. Silva, M.A. Nascimento, L.G. Mendes, T.L. Barroso, G.A. Freire

3:25 513. Electrosynthesis and characterization of polypyrrole/cashew gum composite. **R. Furtado**, J.R. Maciel, M. Oliveira, **C.R. Alves**

3:50 514. Novel polyurethanes from Xylan and TDI: Preparation and characterization. **H. Cheng**, A. Biswas

4:15 Concluding Remarks.

Section D

Moscone Center
272

Developments in the Fields of Celluloses & Lignocelluloses: In honor of Dr. Rajai Atalla

Cosponsored by AGFD, ANYL and POLY

Financially supported by HORIBA Instruments Incorporated; University of Tokyo, Japan; Innventia AB; U.S. Forest Service

U. P. Agarwal, T. J. Elder, T. Larsson, *Organizers*

A. Isogai, *Organizer, Presiding*

1:00 Introductory Remarks.

1:05 515. In situ Raman Microscopy to monitor changes in cellulose crystallinity during acid pre-treatment. **M.T. Timko**

1:30 516. On the ionization of cellulose in aqueous alkali. **D. Bernin**, E. Bialik, B. Stenqvist, Y. Fang, Å. Östlund, I. Furo, B. Lindman, M. Lund

1:55 517. Structural factors affecting ^{13}C NMR chemical shifts of C4 and C6 of cellulose: a computational study. **H. Yang**, T. Wang, D. Oehme, L. Petridis, M. Hong, J.D. Kubicki

2:20 518. Effect of dilution-freezing-drying process on Cellulose Nanocrystals (CNCs) for Polylactic Acid (PLA)-CNC composite packaging. **N. Stark**, R. Sabo, L. Wei, R. Reiner, A. Rudie

2:45 Intermission.

3:00 519. Liquids NMR toolbox for the analysis of modified nanocelluloses. **A. King**, T. Laaksonen, S.A. Kedzior, A.J. Holding, J.K. Helminen, S. Heikkinen, V. Mäkelä, E.D. Cranston, I. Kilpeläinen

3:25 520. In-situ visualization of structural changes to biomass during chemical reactions using neutron scattering. **S. Pingali**, H.M. O'Neill, v. urban, L. Petridis, b. evans, J. Smith, P. Langan, B.H. Davison

3:50 521. Recovery of high-purity levoglucosan and other anhydrosugars from pyrolysis oil. **M.R. Rover**, P.H. Hall, J. Stanford, P. Johnston, R.G. Smith, R.C. Brown

4:15 522. Probing the dehydration induced changes in the organization of cellulose microfibrils in primary cell walls using Sum-Frequency-Generation (SFG) vibrational spectroscopy. **S. Huang**, Y. Zheng, S. Kiemle, D. Cosgrove, S.H. Kim

Section E

Moscone Center
274

Functional Lignocellulosics & Nanotechnology | (nano)Paper: From Fundamentals to Applications/Antimicrobial, Functional Materials

Cosponsored by CARB and COLL

Financially supported by EPNOE

M. K. Ek, E. Filpponen, T. Nypelo, S. Peresin, *Organizers*

S. Spirk, *Organizer, Presiding*

W. Fischer, *Presiding*

1:05 523. Microfluidic paper - influence of fiber source, sheet properties and fiber surface modification on capillary driven flow. **M.A. Biesalski**, A. Böhm, S. Wendenburg

1:30 524. Combined mechanical and chemical modifications towards super-stretchable paper-based materials. **A. Khakalo**, J. Kouko, I. Filpponen, E. Retulainen, O.J. Rojas

1:55 525. Fiber fines: Properties and influence of cellulosic microparticles. **W. Fischer**, R. Schmiedt, L.A. Jagiello, M. Mayr, R. Giner Tovar, S. Spirk, R. Eckhart, W. Bauer

2:20 526. Utilization of polymerized technical lignins in the development of surface sizing formulations for packaging papers. **S. Kopacic**, A. Ortner, G.M. Guebitz, W. Bauer, K. Mahler, K. Hofer, K. Eibinger, T. Kraschitzer

2:45 Intermission.

3:00 527. Layer-by-layer modification of cellulosic materials for green antibacterial materials. A. Ottenhall, C. Chen, J. Henschen, J. Illergård, P.A. Larsson, L. Wagberg, **M.K. Ek**

3:25 528. Purification of water using cellulose: A safe way to remove bacteria. **A. Ottenhall**, T. Seppänen, M.K. Ek

3:50 529. Evaluation of Antibacterial functionalizations of CNF/PVAm multilayer modified cellulose fibre and surface studies on silica model surface. **C. Chen**, J. Illergård, L. Wagberg, M.K. Ek

4:15 530. Film formation and performance of different nanocelluloses obtained from different cellulose sources after different preparation processes. **Y. Zhao**, C. Moser, M.E. Lindström, G. Henriksson, **J. Li**

Section F

Moscone Center
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Valorization of Renewable Resources & Residuals into New Materials & Multiphase Systems

Cosponsored by AGFD

M. L. Auad, J. Campos-Teran, *Organizers*

O. J. Rojas, *Organizer, Presiding*

A. Villares, *Presiding*

1:00 Introductory Remarks.

1:05 531. Cellulose nanofibrils in emulsions stabilized by an ionic surfactant and effect of electrolyte in phase transitions. S. Huan, S. Yokota, M. Ago, M. Borghei, T. Kondo, **O.J. Rojas**

1:30 532. *In situ* biomineralization of hydroxyapatite on bacterial nanocellulose and use as bioink for 3D bioprinting scaffolds to engineer bone. **G. Toriz Gonzalez**, P. Gatenholm

1:55 533. Deep Eutectic Solvent (DES) treatment in nanofibrillation of secondary cellulose raw materials. **T.T. Suopajarvi**, J.A. Sirviö, H. Liimatainen

2:20 534. Oil in water Pickering emulsions stabilized by cellulose nanocrystals-xyloglucan complexes. **A. Villares**, Z. Jaafar, C. Moreau, I. Capron, B. Cathala

2:45 Intermission.

3:00 535. Withdrawn

3:25 536. Mechanical isolation of nanocellulose from paper industry waste by ball mining. **D. Rosa**, F. Kano, A. Souza

3:50 537. Chemical isolation and characterization of cellulose nanofibers to produce bionanocomposite films onto chitosan matrix for seafood packaging. **B. Soni**