9th European Workshop on Lignocellulosics and Pulp

Advances in Chemistry and Processing of Lignocellulosics

PROGRAMME

Vienna / Austria
9th European Workshop on Lignocellulosics and Pulp

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Paul Kosma, BOKU
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Thomas Rosenau, BOKU
Alfred Teischinger, BOKU
Johann Huber, Lenzing AG
Programme

Sunday, August 27

16:00   Registration
(BOKU I: 1190 Wien, Peter Jordan Str. 82)

18:00   Reception
(BOKU I: 1190 Wien, Peter Jordan Str. 82)

Monday, August 28

8:00 – 9:00  Registration
(BOKU II: 1190 Wien, Muthgasse 18)

9:00   Opening Ceremony (Lecture Hall XX)

ADVANCES IN ANALYTICS I

Chair:  GERD WEGENER, Technical University Munich, Germany

9:20   IMMUNO-LABELLING OF WOOD POLYSACCHARIDES
Clemens Altaner, Mike Jarvis
Environmental, Agricultural and Analytical Chemistry, University of Glasgow, UK

9:45   OXYGEN- AND CARBON-CENTERED RADICAL SPECIES
QUANTIFIED BY $^{31}$P NMR
Dimitris S. Argyropoulos, Armando R. Gaspar, Hongyang Li,
Lucian A. Lucia, Orlando J. Rojas
Forest Biomaterials Laboratory, North Carolina State University, Raleigh, USA

10:10  Coffee

ADVANCES IN ANALYTICS II

Chair:  ULF GERMGARD, Karlstad University, Sweden

10:35   THE EFFECT OF SAMPLE PREPARATION ON THE SIZE-
EXCLUSION CHROMATOGRAPHY OF TECHNICAL LIGNINS
IN ORGANIC SOLVENTS
Bodo Saake, Alfred Abächerli, Sascha Lebioda,
Bernhard Ziegler, Ralph Lehnen
Institute for Wood Chemistry and Chemical Technology of Wood, BFH Hamburg,
Germany.

11:00  A NEW FAST AND QUANTITATIVE METHOD FOR THE
TITRATION OF FREE PHENOLIC GROUPS
IN CELLULOSIC PULPS
Rabi Behrooz Eshkiki, Gérard Mortha, Dominique Lachenal
Ecole Française de Papeterie et des Industries Graphiques, Saint Martin d’Hères,
France
ISOLATION AND IDENTIFICATION OF RESIDUAL CHROMOPHORES FROM CELLULOSIC MATERIAL
Thomas Rosenau, Antje Potthast, Paul Kosma
BOKU Vienna, Austria

FILTRATE ANALYSIS AS TOOL TO FOLLOW PEROXIDE BLEACHING PERFORMANCE
Tarja Tamminen, Marjatta Ranua, Benoit Dufour, Raimo Kokkonen, Seppo Kauliomäki
KCL, Espoo, Finland

FIBRE CHARACTERISATION USING COMBINED CONFOCAL RAMAN SPECTROSCOPY AND ATOMIC FORCE MICROSCOPY
Anna-Stiina Jääskeläinen, Monika Österberg
Laboratory of Forest Products Chemistry, HUT, Espoo, Finland

ASSESSING FUNGAL DECAY OF SPRUCE AND BEECH WOOD USING NEAR INFRARED SPECTROSCOPIC TECHNIQUES
Karin Fackler, Manfred Schwanninger, Cornelia Gradinger, Barbara Hinterstoisser, Kurt Messner
Wood K plus, Linz, Austria and Institute of Chemical Engineering and Applied Biosciences, University of Technology Vienna, Austria

IMPROVEMENT OF WOOD ELITE TREES SELECTION BY COMBINING NEAR INFRARED SPECTROSCOPY AND GENETIC TOOLS.
Denilson da Silva Perez, Audrey Guillemain, Luc Harvengt, Christophe Plomion, José Carlos Rodrigues, Guillaume Chantre
AFOCEL InTechFibres, France

BIOMASS UTILIZATION

Chair : CARLOS PASCOAL NETO, University Aveiro, Portugal

SLOW NITROGEN RELEASE ORGANIC SOIL CONDITIONERS FROM LIGNIN BASED INDUSTRIAL RESIDUES FROM THE SOUTH AFRICAN PULPING AND SUGAR INDUSTRIES
Falk Liebner, Luvuyo Tyhoda, Klaus Fischer, Tim Rypstra
TU Dresden, Institute of Plant and Wood Chemistry, Tharandt, Germany and University of Stellenbosch, Department of Forest and Wood Science, South Africa
FURAN CHEMISTRY AT THE SERVICE OF NOVEL MACROMOLECULAR MATERIALS: THE DIELS-ALDER REACTION
Alessandro Gandini
CICECO and Department of Chemistry, University of Aveiro, Portugal

REDUCED ENERGY CONSUMPTION IN PAPERMAKING BY FIBRE SELECTION
J.C. Dekker, A.P.H. Westenbroek, Ed de Jong
Department of Fibre & Paper Technology, Biobased Products, Wageningen, The Netherlands

Tuesday, August 29

PULPING I
Chair: Göran Gellerstedt, KTH, Stockholm, Sweden

8:30 KINETICS OF DELIGNIFICATION UNDER CONSTANT KRAFT COOKING CONDITIONS
Johannes Bogren, Harald Brelid, Hans Theliander
Forest Products and Chemical Engineering, Chalmers University of Technology, Göteborg, Sweden

8:55 NEW POLYOXOMETALATE-LACCASE INTEGRATED SYSTEM FOR KRAFT PULP DELIGNIFICATION
J. Gamelas, A. S. Pontes, D.V. Evtuguin, A.M.B. Xavier
Department of Chemistry, University of Aveiro, Portugal

9:20 MULTISTAGE SULFITE PULPING STUDIED BY LIGNIN MODEL REACTIONS
Gottfried Kandioller, Andreas Griebl, Hedda Weber, Herbert Sixta, Mario Fasching
Wood Kplus, Linz, Austria, and Lenzing AG, Pulp Research, Lenzing, Austria

9:45 CHEMICAL ASPECTS ON CHEMITHERMOMECHANICAL PULPING OF SOFTWOODS AND HARDWOODS
Jonas Konn, Andrey Pranovich, Bjarne Holmbom
Process Chemistry Centre, Åbo Akademi University, Turku/Åbo, Finland

10:10 Coffee

10:35 Poster session I – even numbers

12:15 Lunch
LIGNIN AND BLEACHING I

Chair: ELIBAETH SJÖHOLM, STFI STOCKHOLM, SWEDEN

13:30 HETEROGENEOUS METHYLTRIOXO RHENIUM (MTO)/H2O2 SYSTEMS FOR THE OXIDATION OF LIGNIN AND LIGNIN MODEL COMPOUNDS
Raffaele Saladino, Maria Chiara Caponi, Dimitris S. Argyropoulos, Claudia Crestini
Dipartimento di Scienze e Tecnologie Chimiche Università di Tor Vergata, Roma, Italy

13:55 ON THE IMPORTANCE OF LIGNIN-CARBOHYDRATE BONDS IN OXYGEN DELIGNIFICATION
Martin Lawoko, Yun Ji, Adriaan van Heiningen
University of Maine, Department of Chemical and Biological Engineering, Orono, Maine, USA

14:20 DO WOOD CELL WALLS CONTAIN ONLY CELLULOSE NANO STRUCTURES? LIGNIN NANO-SCALE CHARACTERIZATION USING SMALL- AND ULTRA-SMALL ANGLE X-RAY SCATTERING
Janis Gravitis, Ulla Vainio, Ritva Serimaa
Latvian State Institute of Wood Chemistry, Riga, Latvia

14:45 Coffee

LIGNIN AND BLEACHING II

Chair: OSCAR FAIX, BFH Hamburg, Germany

15:15 FINAL BLEACHING WITH AN OZONE STAGE: BEHAVIOUR OF LIGNIN CHROMOPHORES
Guillaume Pipon, Christine Chirat, Dominique Lachenal
EFPG, Saint-Martin d’Hères Cedex, France

15:40 ON THE ROLE OF HexA IN YELLOWING OF KRAFT PULP
Martin Ragnar, Linda Almquist and Stefan Backa
Kvaerner Pulping AB, R&D, Karlstad, Sweden

16:05 MECHANISMS AND KINETICS: OXIDATION OF CELLULOSE AND CARBOXYLIC ACIDS BY HYPOCHLOROUS ACID
Zhen Zhou, Anna-Stiina Jääskeläinen, Immanuel Adorjan, Tapani Vuorinen
HUT, Department of Forest Products Technology, Espoo Finland

19:00 Banquet – Heuriger “Wolff”, Neustift am Walde, 1190 Wien
Wednesday, August 30

**SURFACE CHARACTERIZATION AND REACTIVITY**

Chair: **ARNIS TREIMANIS**, Riga Wood Research Institute, Latvia

8:30  **MOLECULAR SELF-ASSEMBLY IN KRAFT PULPING OF EUCALYPTUS**
Pedro Fardim, Nelson Durán
Laboratory of Fibre and Cellulose Technology, Åbo Akademi University, Turku/Åbo, Finland

8:55  **THE LIGNIN-CARBOHYDRATE NETWORK IN WOOD AND PULPS. A DETERMINANT FOR REACTIVITY**
Gunnar Henriksson, Martin Lawoko, Maria Eugenia Eugenio Martin, Göran Gellerstedt
Department of Fibre and Polymer Technology, KTH, Stockholm, Sweden

9:20  **ENHANCED REACTIVITY OF CELLULOSE IN DISSOLVING PULPS INTENDED FOR VISCOSO PREPARATION**
Niklas Kvarnlöf, Carl-Axel Söderlund, Leif Jönsson, **Ulf Germgård**
Karlstad University, Karlstad, Sweden

9:45  **INCREASED REACTIVITY OF DISSOLVING PULPS BY DIFFERENT PRETREATMENTS**
Monica Ek, Ann-Charlott Engström, Gunnar Henriksson
Department of Fibre and Polymer Technology, KTH, Stockholm, Sweden

10:10  Coffee

10:35  **Poster session II – odd numbers**

12:15  Lunch

**FIBERS AND MATERIALS I**

Chair: **GÖSTA BRUNOW**, University of Helsinki, Finland

13:30  **CHEMICAL CHARACTERIZATION OF FIBERS FROM HERBACEOUS PLANTS COMMONLY USED FOR MANUFACTURING OF HIGH QUALITY PAPER PULPS**
José C. del Río, Isabel M. Rodríguez, Ana Gutiérrez
Instituto de Recursos Naturales y Agrobiología de Sevilla, Seville, Spain

13:55  **SURFACE CHARACTERIZATION OF CELLULOSE FIBERS PARTIALLY ESTERIFIED WITH FATTY ACIDS**
C. S. R. Freire, A. J. D. Silvestre, C. Pascoal Neto, A. Gandini, P. Fardim, B. Holmbom
CICECO and Department of Chemistry, University of Aveiro, Aveiro, Portugal
14:20 STUDIES ON SISAL FIBERS: CHARACTERIZATION OF LIGNIN; REACTION OF LIGNIN AND FIBERS OXIDIZED BY ClO$_2$ WITH FURFURYL ALCOHOL; MODIFIED FIBERS AS REINFORCEMENT OF PHENOLIC MATRICES
Jackson D. Megiatto Jr, Francielli B. Oliveira, Christian Gardrat, William Hoareau, Alain Castellan, Elisabete Frollini
Instituto de Química de São Carlos, São Carlos, Brazil

14:45 Coffee

**Fibers and Materials II**

**Chair:** BJARNE HOLMBOM, Åbo Akademi, Turku/Åbo, Finland

15:15 NEW HYBRID MATERIALS BASED ON CELLULOSE FIBRES AND TITANIUM DIOXIDE NANOPARTICLES
P.A.A.P. Marques, G. Gonçalves, Tito Trindade, Carlos Pascoal Neto
Chemistry Department, CICECO, University of Aveiro, Portugal

15:40 MATERIAL ALLIANCE OF LIGNIN WITH NATURAL FIBRES
Gerd Wegener, Elisabeth Windeisen, Gunthard Scholz, Christoph Schrader, Jürgen Pfitzer, Helmut Nägele
Wood Research Munich, Technical University of Munich, Munich, Germany

16:05 BIODEGRADABLE FILMS FROM MANNANS
Kirsi Mikkonen, Harry Helén, Riku Talja, Stefan Willför, Bjarne Holmbom, Lea Hyvönen, Maija Tenkanen
Department of Applied Chemistry and Microbiology, HUT, Helsinki, Finland

16:30 Closing

19:30 Board Meeting Holzforschung
1. **INFLUENCE OF CARBONYL GROUPS ON THE BRIGHTNESS REVERSION OF EUCALYPTUS KRAFT PULP**
Immanuel Adorjan, Zhen Zhou, Anna-Stiina Jääskeläinen, Antje Potthast, Tapani Vuorinen
HUT, Department of Forest Products Technology, Finland

2. **SYNTHESIS AND APPLICATION OF THE HexA MODEL METHYL 4-DEOXY-β-L-THREO-HEX-4-ENOPYRANOSIDURONIC ACID**
Immanuel Adorjan, Anna-Stiina Jääskeläinen, Zhen Zhou, Tapani Vuorinen
HUT, Department of Forest Products Technology, Finland

3. **BIRCH LIGNIN MACROMOLECULAR STRUCTURE TRANSFORMATION IN ALKALINE WATER-ETHANOL DELIGNIFICATION**
N.I. Afanasiev, A.V. Phesenko, G. F. Prokshin, Vishnjakova A.P.
Institute of Ecological Problems in the North RAS, Arkhangelsk, Russia

4. **MACROMOLECULAR AND SPECTRAL CHARACTERISTICS OF LIGNINS, ISOLATED DURING MODIFIED ALKALINE DELIGNIFICATION OF HARDWOOD**
Afanasyev N., Gusakova M., Pauzhina G., Brovko O.
Institute of Ecological Problems in the North, RAS, Arhangelsk, Russia

5. **GENERATION OF PERACETIC ACID FROM HYDROGEN PEROXIDE AND ACETYL-CONTAINING ACTIVATORS**
Stefan Backa, Martin Ragnar
Kvaerner Pulping AB, Karlstadt, Sweden

6. **LONG-TIME IMPACT OF SALT SEAWATER UPON CONIFEROUS WOOD**
Lubova Belkova, Galina Dobele, Boguslava Walszewska, Josef Kudela
Latvian State Institute of Wood Chemistry, Riga, Latvia

7. **IMPROVING SEMI-EMPIRICAL MATHEMATICAL MODELING OF CHLORINE DIOXIDE DELIGNIFICATION**
N. Bénattar, G. Mortha, C. Calais
Ecole Française de Papeterie et des Industries Graphiques, Saint Martin d'Hères, France

8. **CHEMICAL IDENTIFICATION OF EXTRACTIVE COMPONENTS IN BARKS OF SOME HARDWOOD AND SOFTWOOD SPECIES**
Frédérique Bertaud, Markku Reunanen, Linda Nisula, Bjarne Holmbom, Patrick Chareyre, Christian Masure
Centre Technique du Papier, Grenoble, France
9. MULTI-PURPOSE APPLICATIONS OF BIO-ACTIVE EXTRACTIVES FROM KNOTS AND BARK: ASSESSMENT OF INNOVATIVE EXPLOITATION OF INDUSTRIAL WOOD PULPING BY-PRODUCTS
Frédérique Bertaud, Delphine Craperi, Gilles Lenon, Maria Currais-Lino, Romeo Radman, Tajalli Keshavarz, Linda Nisula, Bjarne Holmbom, Abir Isam Nazer, Romain Briandet, Markku Ahotupa
Centre Technique du Papier, Grenoble, France

10. CHEMICAL MODIFICATION OF LIGNOCELLSULOSIC WASTES AND ITS APPLICATION TO WOOD-PVC COMPOSITE MATERIALS
Ruxanda Bodirlau, Iuliana Spiridon, Carmen-Alice Teaca
“Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania

11. SOLVATION EFFECTS INFLUENCE ON REDOX PROPERTIES OF LIGNIN’S GUAIACYL STRUCTURES IN WATER-ETHANOL MEDIA
K. Bogolitsyn, A. Malkov
Pure and Applied Chemistry Department, Arkhangelsk State Technical University, Arkhangelsk, Russia

12. HOMOGENEOUS CATALYTIC OXIDATION OF LIGNIN MODEL COMPOUNDS IN WATER-ETHANOL MEDIUM
K. Bogolitsyn, A. Kosheleva, N. Popova
Department of Theoretic and Applied Chemistry, Arkhangelsk State Engineering University, Arkhangelsk, Russia

13. ELECTROCHEM. OXIDATION OF LIGNIN MODEL COMPOUNDS
K.G.Bogolitsyn, N.L.Ivanchenko, A.N.Shkaev, E.F.Potapova
Department of Theoretic and Applied Chemistry, Arkhangelsk State Engineering University, Arkhangelsk, Russia

14. KINETICS OF FORMATION AND DEGRADATION OF HEXENURONIC ACID IN PINE WOOD MEAL UNDER ALKALINE CONDITIONS
Johannes Bogren, Harald Brelid
Forest Products and Chemical Engineering, Chalmers University of Technology, Göteborg, Sweden

15. INITIAL STUDY OF THE RELATION BETWEEN THE THERMAL PROPERTIES OF KRAFT LIGNIN AND ITS CHEMICAL COMPOSITION
Ida Brodin, Anders Uhlin, Elisabeth Sjöholm
STFI-Packforsk, Stockholm, Sweden

16. FTIR AND NMR STUDIES ON LIGNIN ACETYLATION
C.A. Cateto, M.F. Barreiro, A.E. Rodrigues
M.C. Brochier-Salon, W. Thielehems, M.N. Belgacem
LSRE - Laboratory of Separation and Reaction Engineering, Instituto Politécnico de Bragança, Campus de Santa Apolónia, Bragança, Portugal and Matériaux Polymères, École Française de Papeterie et des Industries Graphiques, France

17. STRUCTURAL AND CHEMICAL CHANGES IN WOOD AND LIGNIN AT LOW TEMPERATURE TREATMENT
Jelena Chirkova, Galina Dobele, Igor Urbanovich, Ingeborga Andersone, Bruno Andersons
Latvian State Institute of Wood Chemistry, Riga, Latvia
18. STRUCTURAL MODIFICATIONS OF CELLULOSE ALLOMORPHS DURING THE ENZYMATIC HYDROLYSIS REACTION
Diana Ciolacu
“Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania

19. DSC INVESTIGATIONS ON THE CELLULOSE POLYMORPHS ACCESSIBILITY
Diana Ciolacu, Georgeta Cazacu
“Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania

20. BEHAVIOUR OF QUATERNARY COMPOSITES BASED ON NATURAL POLYMERS AND POLYETHYLENE MATRIX
Gabriela Constantinescu, Georgeta Cazacu
“Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania

21. ECO-FRIENDLY COMPOSITES OBTAINED FROM NATURAL POLYMERS AND POLYETHYLENE MATRIX
Gabriela Constantinescu, Valentin I. Popa
“Petru Poni” Institute of Macromolecular Chemistry, Iasi, Romania

22. SURFACE MODIFICATION OF CELLULOSE FIBRES WITH FLUORINE-CONTAINING COMPOUNDS
G. Cunha, C. S. R. Freire, A. J. D. Silvestre, C. Pascoal Neto, A. Gandini
CICECO and Department of Chemistry, University of Aveiro, Aveiro, Portugal

23. HOW DOES WOOD VARIABILITY IMPACT KRAFT PULPING?
Denilson da Silva Perez, Pierre Nougier, Audrey Guillemain, Guillaume Chantre, José Carlos Rodrigues, Michel Petit-Conil.
AFOCEL InTechFibres, Wood-Process Laboratory, Grenoble, France

24. STUDYING THE STRUCTURE OF NATIVE, RESIDUAL AND DISSOLVED LIGNINS BY FT-IR SPECTROSCOPY METHOD
Olga Derkacheva, Dmitry Sukhov
State Technological University of Plant Polymers, St.Petersburg, Russia

25. EVALUATION OF ANTIOXIDANT PROPERTIES OF LIGNIN PRODUCTS FROM PULPING PROCESSES
T. Dizhbite, G. Telysheva, V. Jurkjane
Latvian State Institute of Wood Chemistry, Riga, Latvia

26. WOOD-BASED HIGH-EFFICIENT CARBON SORBENTS
G. Dobele, V. Jurkjane, I. Urbanovich, G. Telysheva, N. Bogdanovich, O. Kalinicheva, N. Orlova
Latvian State Institute of Wood Chemistry, Riga, Latvia

27. PREPARATION OF HIGH-VALUE COMPOUNDS FROM XYLAN: SYNTHESIS AND DERIVATIZATION OF XYLOOLIGOMERS
Beatriz Abad Romero, Christian Leitner, Thomas Rosenau, Antje Potthast, Paul Kosma, Dietmar Haltrich and Herbert Sixta
BOKU, Department of Chemistry, Vienna, and WOOD Kplus GmbH Linz, Austria
28. IMPROVEMENT OF BLEACHED KRAFT PULP PROPERTIES BY CELLULOSE OXIDATION
Research Unit of Textile and Paper Materials, University of Beira Interior, Covilhã, Portugal

29. POLYMERIC BIOSURFACTANTS FROM BEECHWOOD 4-O-METHYLGLUCURONOXYLAN
Anna Ebringerová, Petra Skalková, Iva Sroková, Vlasta Sasinková,
Anna Malovíkova, Zdenka Hromádková
Institute of Chemistry, Slovak Academy of Sciences, Bratislava, Slovakia

30. BIOMIMETIC ALKALINE PEROXIDE BLEACHING USING COPPER COMPLEXES WITH POLYDENTATE LIGANDS
Karin Fackler, Takashi Watanabe, Kurt Messner
Institute of Chemical Engineering, University of Technology Vienna, Austria,

31. KNOTWOOD EXTRACTIVES FROM PINUS PINASTER
J. A. Figueiredo, Suzana Martins, Carla Abrantes, M. Isabel Ismael, Jesus L. Rodilla,
Rogério Simões, Ana Paula Duarte, Armando J. D. Silvestre
Unidade de Materiais Têxteis e Papeleiros, Universidade da Beira Interior, Covilhã, Portugal

32. TOWARD AN UNDERSTANDING OF THE EFFICACY OF GREEN LIQUOR PRETREATMENT IN KRAFT PULPING
Ilari Filpponen, Anderson Guerra, Lucian A. Lucia, Dimitris S. Argyropoulos
Forest Biomaterials Laboratory, North Carolina State University, Raleigh, USA

33. HEMICELLULOSE COMPOSITION IN THE OUTER CELL WALL LAYERS OF PAPER GRADE SULFITE AND SULFATE PULPS
M. Freese, I. Schmidt, K. Fischer
Institute of Plant and Wood Chemistry, TU Dresden, Tharandt, Germany

34. LIGNIN OXIDATION AND FRAGMENTATION IN SUPERCritical FLUIDS AND EXPANDED LIQUIDS
Armindo R. Gaspar, Carl D. Saquing, Nestor U. Soriano Jr., Lucian A. Lucia,
Dimitris S. Argyropoulos
Forest Biomaterials Laboratory, North Carolina State University, Raleigh, USA

35. THE KINETIC REACTIVITY OF DISSOLVING PULPS IN THE PREPARATION OF CMC
Ulf Germgård, Alexander Hedlund
Department of Chemical Engineering, Karlstad University, Karlstad, Sweden

36. INVESTIGATION OF TECHNICAL HYDROLYSIS LIGNIN AND PRODUCTS OF ITS ALKALINE TREATMENT
I. Gribkov, S. Krutov, E. Windeisen, G. Wegener
Wood Research Munich, Technical University of Munich, Munich, Germany

37. DIFFERENT WOOD SPECIES OFFER DIFFERENT YIELDS, LIGNIN STRUCTURES & MOLECULAR WEIGHTS WHEN ISOLATED WITH THE SAME METHOD
Anderson Guerra, Ilari Filpponen, Lucian Lucia, Dimitris S. Argyropoulos
Forest Biomaterials Laboratory, North Carolina State University, Raleigh, USA
38. GAS CHROMATOGRAPHY/MASS SPECTROMETRY STUDY OF ENZYMATIC REMOVAL OF STEROLS FORMING PITCH DEPOSITS IN TCF BLEACHING OF EUCALYPT KRAFT PULP
Ana Gutiérrez, José C. del Río, David Ibarra, Jorge Rencoret, Javier Romero, Ángel T. Martínez
Instituto de Recursos Naturales y Agrobiología, Seville, Spain

39. FIBER BOARDS BASED ON SUGARCANE BAGASSE LIGNIN AND FIBERS
William Hoareau, Francielli B. Oliveira, Stéphane Grelier, Bernard Siegmund, Elisabete Frollini, Alain Castellan
Laboratoire de Chimie des Substances Végétales, Université Bordeaux, France and Instituto de Química de São Carlos, Brazil

40. CHEMICAL CHARACTERIZATION OF EUCALYPT PULP LIGNIN DURING TCF BLEACHING INCLUDING A LACCASE-MEDIATOR STAGE: 2D-NMR, FTIR AND PY-GC/MS OF ENZYMATICALLY-ISOLATED RESIDUAL LIGNINS
David Ibarra, María Isabel Chávez, Jorge Rencoret, José Carlos del Río, Ana Gutiérrez, Javier Romero, Susana Camarero, María Jesús Martínez, Jesús Jiménez-Barbero, Angel T. Martínez
CIB, CSIC, Madrid, Spain

41. AEROCCEL: A EUROPEAN PROJECT TO PRODUCE AEROGELS FROM CELLULOSIC MATERIALS
Josef Innerlohinger, Hedda Weber, Haio Harms, Gregor Kraft
Lenzing AG, 4860 Lenzing, Austria

42. THE RELATIONSHIP BETWEEN XYLAN AND HEXENURONIC ACID IN EUCALYPTUS KRAFT PULPING
Dan Johansson and Ulf Germgård
Department of Chemical Engineering, Karlstad University, Karlstad, Sweden

43. STRUCTURAL ELUCIDATION OF COMT DEFICIENT BIRCH LIGNINS IN LIGHT OF LIGNIN MODEL COMPOUND STUDIES
Pirkko Karhunen, Paula Nousiainen and Jussi Sipilä, Hely Häggman, Heidi Tiimonen
Department of Chemistry, Laboratory of Organic Chemistry, University of Helsinki, Finland

44. SYNTHESIS OF CHITO-DODECAOSE BY POLYMERIZATION OF A STARTING CHITIBIOSE DERIVATIVE
Toshinari Kawada, Kensaku Shimizu, Yuko Yoneda, Thomas Rosenau
Graduate School of Agriculture, Kyoto Prefectural University, Kyoto, Japan.

45. THE ELECTROCHEMICAL DETERMINATION OF WATER-SOLUBLE LIGNINS
Khabarov Yu.G., Peš'yakova L.A., Kamakina N.D.
Arkhangelsk State Technical University, Arkhangelsk, Russia

46. THE MODIFICATION OF LIGNINS BY IRON COMPOUNDS
Khabarov Yu.G.
Arkhangelsk State Technical University, Arkhangelsk, Russia
47. THE POTENTIALITY OF APPLICATION OF TETRAALKYLAMMONIUM HYDROXIDES FOR PULPING
M.F. Kiryushina, T.G. Fedulina, V.S. Soultanov, M.Ya. Zarubin
St. Petersburg Forest Technical Academy, St. Petersburg, Russia

48. CHARACTERISATION OF SAWDUST-LIKE WOOD MATERIALS
Risto Korpinen, Pedro Fardim
Åbo Akademi University, Laboratory of Fibre and Cellulose Technology, Turku/Åbo, Finland

49. REDUCTION OF GENOTOXIC EFFECT OF CARCINOGENS AND OXIDATIVE DAMAGE OF POLYOLEFINS BY LIGNIN PREPARATIONS
Košíková Božena, Lábaj Juraj, Gregorová Adriána, Slameňová Darina
Institute of Chemistry, Slovak Academy of Sciences, Bratislava, Slovak Republic

50. ACIDITY AND SOLVATION OF SOME PHENOLS RELATED TO LIGNIN IN BINARY MIXED SOLVENTS WATER-ACETONE AND WATER-DIOXANE
D. S. Kosyakov, K. G. Bogolitsyn, N. V. Shorina, N. S. Gorbova
Arkhangelsk State Technical University, Arkhangelsk, Russia

51. ALKALINE ETHANOL-WATER DELIGNIFICATION - KINETIC ASPECTS
A. Kozhevnikov, K. Bogolitsyn, T. Skrebets
Arkhangelsk State Technical University, Arkhangelsk, Russia

52. Py-GC-MS OF MODEL COMPOUNDS OF LIGNIN AND INDUSTRIAL HYDROLYTIC LIGNINS
S. Krutov, I. Gribkov, I. Sumersky, A. Pranovich, V. Soultanov, M. Reunanen, M. Zarubin
St. Petersburg Forest Technical Academy, St. Petersburg, Russia

53. FORMATION OF FREE RADICALS AT CHEMICAL, PHOTO- AND RADIATION-CHEMICAL ACTION ON LIGNIN-CARBOHYDRATE COMPLEX
Svetlana I. Kuzina, Irina A. Shilova and Alfa I. Mikhailov
Institute of Problems of Chemical Physics, Russian Academy of Sciences, Moscow Region, Russia

54. ON THE OXIDATION OF SOME LIGNIN MODEL COMPOUNDS WITH LACCASES MELANOCARPUS ALBOMYCES AND TRAMETES HIRSUTA
Maarit Lahtinen, Martina Andberg, Kristiina Kruus, Jussi Sipilä
University of Helsinki, Department of Chemistry, Laboratory of Organic Chemistry, Finland

55. PROPERTIES OF MICROCRYSTALLINE CELLULOSE AND CHITOSAN GELS OBTAINED USING THERMOCATALYTIC DESTRUCTION
M. Laka, S. Chernyavskaya
Latvian State Institute of Wood Chemistry, Riga, Latvia
56. THE CONFORMATION OF LIGNIN AS JUDGED BY X-RAY CRYSTALLOGRAPHIC INVESTIGATIONS OF LIGNIN MODEL COMPOUNDS
Vratislav Langer, Knut Lundquist, Jim Parkås
Forest Products and Chemical Engineering, Department of Chemical Engineering and Environmental Science, Chalmers University of Technology, Göteborg, Sweden

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