



INTERNATIONAL PULP BLEACHING  
CONFERENCE

# PROGRAMME

October 29-31, 2014

Grenoble – France



# INTERNATIONAL PULP BLEACHING CONFERENCE

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# INTERNATIONAL PULP BLEACHING CONFERENCE

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# IPBC 2014 Program

## Wednesday, October 29th, 2014 (Grenoble Art Museum)

14h00 – 15h00 : registration and coffee

### IPBC 2014 Opening session: 15h00 – 18h00

Chair : Christine Chirat

- 15h00 - 15h30: Welcoming remarks  
**Gopal Goyal**, International Paper
- 15h30 - 16h00: “Bleaching in the age of biomaterial”  
**Petri Vasara**, Pöyry Management Consulting Oy
- 16h00 - 16h30: “What does it take to be able to implement new processes?”  
**Mats Backman**, Director R&D Pulp Business area, UPM
- 16h30 - 17h00: “Risk mitigation in modern fibre lines and bleach plants  
How to prevent disasters! “  
**Tony Johnson**, Business Director Forest Industries, Beca AMEC
- 17h00 - 17h30: “Specialty Cellulose Manufacture: much more than just bleaching”  
**Denis Sens**, Research Director, Tembec
- 17h30 - 18h00: “The scenario of pulp bleaching technology in South America”  
**Marcelo Rodrigues da Silva**, R&D, Fibria

**18h30 - 19h30 : Private tour of the Art Museum**

**19h30 - 21h30 : Welcoming dining cocktail in the Art Museum**

## Thursday, October 30, 2014 (University campus)

### Session 1. Advances in oxygen and ozone delignification (1): 8h30 – 10h10

Chair : Tom Mc Donough

- 8h30 - 8h55: “Bleaching practices for oxygen delignified softwood pulp : analysis of the 2013 Paptac bleaching committee survey”  
**Paul F. Earl<sup>1</sup>, Dan Davies<sup>2</sup>, Brian La Brash<sup>3</sup>, Honey Nampak<sup>4</sup>, Doug Reid<sup>5</sup>, Murray Walters<sup>6</sup>**  
<sup>1</sup> Paul Earl Consulting Inc., <sup>2</sup> Evonik Canada Inc., <sup>3</sup> Verso Paper,  
<sup>4</sup> Harmac Pacific, <sup>5</sup> Akzo Nobel Pulp and Performance Chemicals Inc.,  
<sup>6</sup> Allnorth Consultants
- 8h55 - 9h20: “Oxygen delignification kinetics of high kappa softwood Kraft pulp at high temperatures with or without the presence of viscosity protectors”  
**Vahid Jafari<sup>1</sup>, Herbert Sixta<sup>1</sup>, Kaarlo Nieminen<sup>1</sup>,  
Adriaan van Heiningen<sup>1,2</sup>**; <sup>1</sup> Aalto University, <sup>2</sup> University of Maine

- 9h20 - 9h45: "Characterization of oxygen dispersion in delignification process"  
**Heikki Mutikainen<sup>1</sup>, Kari Peltonen<sup>2</sup>, Olavi Pikka<sup>2</sup>, Jari Käyhkö<sup>1</sup>**  
<sup>1</sup>Mikkeli University of Applied Sciences, <sup>2</sup>Andritz Oy
- 9h45 - 10h10: "Examination on which carbon-hydrogen bond of a carbohydrate model compound, methyl glucoside, is preferentially abstracted by active oxygen species under oxygen delignification conditions"  
**Tomoya Yokoyama, Akihiko Nakagawa, Fumiko Konishi, Yuji Matsumoto**, The University of Tokyo
- 10:10 - 10:40: Coffee break

## Session 2. Advances in oxygen and ozone delignification (2): 10h40 – 11h55

Chair : Paul Earl

- 10h40 - 11h05: "New aspects on oxygen delignification of sulfite pulp-Influence of alkali, pH and ionic strength"  
**Johan Johansson, Anwar Nasser, Ulf Germgård**, Karlstad University
- 11h05 - 11h30: "Oxygen and ozone delignification of high kappa number sulphur-free soda hardwood pulps - pulp and papermaking properties"  
**Asikainen S., Hulthom T., Hassinen E., Varhimo A.**, VTT
- 11h30 - 11h55: "The role of hydroxyl radicals in selectivity of ozone delignification"  
**Frédéric Pouyet, Christine Chirat, Dominique Lachenal**, Grenoble INP-Pagora/LGP2
- 11h55 - 13h00: Lunch
- 13h00 - 14h00: **Poster session 1**

## Session 3. Chromophore formation and yellowing: 14h00 - 15h15

Chair : Kristiina Poppius Levlin

- 14h00 - 14h25: "On the formation of chromogen structures from xylan by chlorine dioxide as revealed from model experiments"  
**E.V. Costa<sup>1,2</sup>, M.R. Domingues<sup>2</sup>, D.V. Evtuquin<sup>1</sup>**, <sup>1</sup>University of Aveiro, <sup>2</sup>University of Coimbra
- 14h25 - 14h50: "Oxidized groups formed on carbohydrates during bleaching and their effect on alkali yellowing"  
**Jordan Perrin, Christine Chirat, Dominique Lachenal**, Grenoble INP-Pagora/LGP2
- 14h50 - 15h15: "On yellowing effects and color formation from hexeneuronic acids - formation mechanism and defined chromophore structures"  
**Thomas Rosenau<sup>1</sup>, Antje Potthast<sup>1</sup>, Karin Krainz<sup>2</sup>, Yuko Yoneda<sup>3</sup>, Thomas Dietz<sup>4</sup>, Hans Ulrich Suess<sup>4</sup>**, <sup>1</sup>BOKU University, <sup>2</sup>Air Liquide, <sup>3</sup>Kyoto Prefectural University, <sup>4</sup>Degussa-Evonik
- 15h15 - 15h45: Coffee break

## Session 4. New bleaching agent: 15h45 – 16h35

**Chair : Antje Potthast**

- 15h45 - 16h10: "Developments in amine catalyzed pulp bleaching"  
**Naveen Kumar Chenna, Christian Järnefelt, Juli Sucipto,  
Susanna Kuitunen, Tapani Vuorinen, Aalto University**
- 16h10 - 16h35: "Intensified bleaching of hardwood kraft pulp with a novel sequence",  
**Ghazaleh Afsahi and Tapani Vuorinen, Aalto University**
- 18h00 :** ***Departure to Château de Sassenage from the coaches' station next to the railway station***
- 18h30 - 23h00 :** ***Gala dinner at Château de Sassenage***

**Friday, October 31, 2014 (University campus)**

**Session 5. Brightening and post-bleaching stages: 9h00 – 10h40**

**Chair : Jorge Colodette**

- 9h00 - 9h25: "Mill implementation of the near neutral chlorine dioxide brightening technology"  
**André Audet<sup>1</sup>, Shree Prakash Mishra<sup>1</sup>, Gail Sherson<sup>2</sup>, and Paul F. Earl<sup>3</sup>**  
<sup>1</sup>FPIinnovatons, <sup>2</sup>FPIinnovatons, <sup>3</sup>Paul Earl Consulting Inc.
- 9h25 - 9h50: "PAA in post-bleaching of birch kraft pulp. From laboratory to mill"  
**Leif Robertsen<sup>1</sup> and Tom Hultholm<sup>2,1</sup>, Kemira,<sup>2</sup> UPM**
- 9h50 - 10h15: "Performance of enzymatic stage in ECF bleaching sequences of eucalyptus kraft pulp"  
**Joana I. T. Sousa<sup>1,2</sup>, Dmitry V. Evtuguin<sup>1</sup>, M. Graça V. S. Carvalho<sup>2</sup>**  
<sup>1</sup>University of Aveiro, <sup>2</sup>University of Coimbra
- 10h15 - 10h40: "New enzymatic technology boosts bleaching efficiency "  
**Michael Wang<sup>1</sup>, Robert Cooper<sup>1</sup>, Greg DeLozier<sup>2</sup>,**  
<sup>1</sup>Buckman International, <sup>2</sup>Novozymes, Inc.
- 10:40 - 11:10: Coffee break

**Session 6. Bleaching for biorefinery and dissolving pulps (1): 11h10 – 12h25**

**Chair : Monica Ek**

- 11h10 - 11h35: "Effect of cooking, oxygen delignification and bleaching on final sugar content of prehydrolysed softwood kraft pulps"  
**Christine Chirat, SatyaJit Das, Dominique Lachenal,**  
Grenoble INP-Pagora/LGP2
- 11h35 - 12h00: "New TCF bleaching and purification processes to convert kraft pulp into dissolving pulp"  
**Benoît Arnoul-Jarriault, Christine Chirat, Dominique Lachenal,**  
Grenoble INP-Pagora/LGP2

12h00 - 12h25: "The effect of eucalypt kraft pulp xylan removal on its bleachability and reactivity"  
**Jorge L. Colodette and Fernando J. B. Gomes**, Federal University of Viçosa

12h25 - 13h30: Lunch

13h30 - 14h15 : **Poster session 2**

**Session 7. Bleaching for biorefinery and dissolving pulps (2): 14h15 – 15h05**  
**Chair : Tomoya Yokoyama**

14h15 - 14h40: "Effect of oxygen delignification prior to enzymatic treatment for upgrading paper-grade kraft pulp to viscose-grade dissolving pulp"  
**Sabrina Burkhardt**, Econotech

14h40 - 15h05: "New strategies to bleach dissolving pulps using enzymatic treatments"  
**Elisabet Quintana, Cristina Valls, Teresa Vidal and M. Blanca Roncero**  
Universitat Politècnica de Catalunya-BarcelonaTech

15h05 - 15h35: Coffee break

**Session 8. Process improvement: 15h35 – 16h25**  
**Chair : Christine Chirat**

15h35 – 16h00: "Analyzing fiber charge in chemical pulp with the aim of improving bleaching process control"  
**Pär Lindén, Elisabet Brännvall and Olena Sevastyanova**, KTH

16h00 - 16h25: "Recycling of acidic bleaching effluents of a kraft pulp mill with nanofiltration"  
**K. Tirkkonen, M. Kallioinen and M. Mänttari**  
Lappeenranta University of technology

**16h25 - 16h45: Closing words**  
**Dominique Lachenal**, Grenoble INP-Pagora/LG2

## List of posters

- P1. “Studies of the effect of pre-hydrolysis, pulping and bleaching, on producing dissolving pulp from *Acacia farnesiana* (huizache)”  
**Fernando Navarro-Arzate, María Goretty Muñoz-Rodríguez, Florentina Dávalos-Olivares, Juan Pablo Morales-Rivera, Bruno Becerra-Aguilar and Rogelio Ramírez-Casillas**  
*University of Guadalajara*
- P2. “An outlook on sodium chlorate and hydrogen peroxide as bleaching agents”  
**Stephanie Koenig**, IHS Chemical
- P3. “The green technology concept - on-site production of oxygen, ozone and hydrogen peroxide from renewables”  
**Alexis Métais<sup>1</sup>, Pierre Larnicol<sup>2</sup>, Guy Verkoeyen<sup>3</sup>, Jean-Christophe Hostachy<sup>1</sup>, Jérôme Blanc<sup>2</sup> and Filip Smeets<sup>3</sup>**  
<sup>1</sup>Xylem Inc., <sup>2</sup>Arkema, <sup>3</sup>Hydrogenics
- P4. “A model-based process control strategy for near-neutral pH pulp bleaching using continuous sensors”  
**Richard Van Fleet<sup>1</sup> and Duane Moringred<sup>2</sup>**  
<sup>1</sup>BTG Americas Inc, <sup>2</sup>Honeywell International
- P5. “Mg(OH)<sub>2</sub> based hydrogen peroxide bleaching of chemimechanical pulps”  
**Rabi Behrooz and Somayeh Ghasemi**, *Tarbiat Modares University*
- P6. “Latest trends on the use of hydrogen peroxide”  
**Jérôme Blanc<sup>1</sup>, Pierre Larnicol<sup>1</sup>, Dominique Lachenat<sup>2</sup> and Christine Chirat<sup>2</sup>**  
<sup>1</sup>Arkema France, <sup>1</sup>Grenoble INP-Pagora
- P7. “Dissolved lignin in the pulp can significantly increase the consumption of ClO<sub>2</sub> in the D<sub>0</sub> stage”  
**Caroline Wilke<sup>1,2</sup>, Niclas Andersson<sup>1</sup> and Ulf Germgård<sup>2</sup>**  
<sup>1</sup>BTG Instruments AB, <sup>2</sup> Karlstad University
- P8. “D bleaching: a simple titration method to evaluate the occurrence and formation of phenolic hydroxyl and carboxylic groups in the pulps and their effluents”  
**Fanny Bardot, Karine Janel and Gérard Mortha**, Grenoble INP – Pagora
- P9. “The advanced white liquor oxidation process - One way to increase reuse of by-products in pulp mills”  
**Pascal Baldo, Philippe Campo, Jörg Schwerdt and Arnaldo Oliveira Araujo**  
*Air Liquide*
- P10. “Quantification of organochlorine compounds in tertiary amine catalysed hypochlorous acid pulp bleaching”  
**Pablo Piovano, Naveen Kumar Chenna, Christian Järnefelt and Tapani Vuorinen**  
*Aalto University*
- P11. “Kinetic analysis of the β-O-4 bond cleavage of lignin during alkaline cooking process”  
**Satoko Shimizu, Pattaraporn Posoknistakul, Tomoya Yokoyama and Yuji Matsumoto**  
*The University of Tokyo*
- P12. “Bleaching optimization of a dyed kraft pulp using alkaline H<sub>2</sub>O<sub>2</sub> activated by the Cu(II)-phenanthroline complex”  
**Elsa Walger, Camille Rivollier, Nathalie Marlin and Gérard Mortha**  
*Grenoble INP-Pagora*



- P13. "Relationship between lignin-carbohydrates complexes (LCC) from chips and pulps and their delignification and bleaching ability"  
***Claire MONOT, Brieuc EVANGELISTA, Satyajit DAS and Christine CHIRAT***  
Grenoble INP-Pagora
- P14. "Kinetics of hexenuronic acids formation and degradation during kraft cooking of hardwoods and softwoods"  
***D. Da Silva Perez<sup>1</sup>, G. Mortha<sup>2</sup>, C. Freitas<sup>1,3</sup>, A. Guillemain<sup>1</sup>, M. Margarido<sup>1,2</sup> and M. Petit-Conil<sup>1,4</sup>***  
<sup>1</sup>FCBA, <sup>2</sup> Grenoble INP-Pagora, <sup>3</sup>Instituto Politécnico de Castelo Branco, <sup>4</sup>Centre Technique du Papier
- P15. "Improvement of physical properties of kraft pulps by ozone treatment in the last stage"  
***D. Da Silva Perez<sup>1</sup>, A. Guillemain<sup>1</sup> and M. Petit-Conil<sup>1,2</sup>***  
<sup>1</sup>FCBA, <sup>2</sup>Centre Technique du Papier
- P16. "Mixed magnesium sodium alkali systems in mechanical pulp peroxide bleaching"  
***Rob van Vliet<sup>1</sup>, Sabine Woldendorp<sup>1</sup> and Peter Biza<sup>2</sup>***  
<sup>1</sup>Nedmag industries, <sup>2</sup>Imerys
- P17. "Towards new applications of magnesium hydroxide in the bleaching sequence of chemical pulps"  
***Gérard Mortha<sup>1</sup>, Carolina Arenas Suescun<sup>1</sup>, Robert van Vliet<sup>2</sup> and Robert Gartner<sup>3</sup>***  
<sup>1</sup>Grenoble INP-Pagora, <sup>2</sup>Nedmag Industries, <sup>3</sup>Lhoist Co.
- P18. "The washing: a good technical solution to improve hydrogen peroxide bleaching of mechanical pulp, the efficiency of the paper machine and the waste treatment with lower chemical consumption"  
***Didier Tavernier***
- P19. "Biotechnological processes for the bleaching of pulp"  
***Lyubov Yotova, Ivo Valchev, Lachezar Manovski, Ahmed Hassan***  
University of Chemical Technology and Metallurgy, Bulgaria
- P20. "Substitution of sodium hydroxide during alkaline bleaching stage of chemical pulp, TMP and DIP"  
***A. Burnet, L. Savoye, P. Huber, V. Meyer, M. Petit-Conil***, Centre Technique du Papier
- P21. "Bleach plant control optimization using inline brightness and residual measurements along with on-line kappa measurements"  
***James Goldman***, Metso Automation
- P22. "Annual plants pulps Bleaching using co-rotating Twin Screw Technology"  
***Sylvie Brunel and Philippe Combette***, Clextral



## Social programme

### 1. **Wednesday, October 29, 2014 : visit of Grenoble Museum of Art and welcoming cocktail (6:30 – 9:30 pm)**

(included in the IPBC fees for the participants and complimentary for the accompanying persons)

The opening session of the IPBC conference will take at the Grenoble Museum of Art from 3:00 to 6:00 pm.

It will be followed by a private visit of some rooms of the Museum for the IPBC participants and their accompanying persons (upon registration in the registration form) : 6:30 to 7:30 pm

A welcoming dining cocktail will then be served for the participants in the heart of the museum from 7:30 to 9:30 pm.

<http://www.museedegrenoble.fr>

### 2. **Thursday, October 30, 2014 : gala dinner in Château de Sassenage (6:30 – 11:00 pm)**

(included in the IPBC fees for the participants. Registration and payment needed for the accompanying persons : 100 euros per person)

This castle is a magnificent example of the 17th century French castle architecture.

A visit of the castle will be organized prior to the gala dinner and there will be the possibility for the participants to prepare macaroons with a master pastry Chef.

<http://www.chateau-de-sassenage.com>

### 3. **Friday October 31, 2014 : Discovery of the old city center and the Bastille with English speaking guides, and dinner at the top of the Bastille (6:00 – 11:00 pm)**

(you need to register for that tour : 65 euros per person)

#### ***Pedestrian tour of the old city center (1:30)***

Covering 2000 years of history through the pedestrian streets of the downtown centre, relax and be charmed by Grenoble, the old capital of Dauphiné.

Discover its Roman ramparts dating from the end of the 3rd century, its typical squares (Gordes Squares, Saint André Square, Place aux Herbes...), its 13th century cathedral and the remnants of its 14th century Baptistery, its 17th century private mansions, its gothic inner courtyard...

<http://www.grenoble-tourisme.com/en/discover/rediscover-grenoble/city-strol>

***Then board the cable car***, and enjoy the discovery of the Bastille beauty spot where you can benefit from a panoramic view

Being the first urban cable car in the world built in 1934 in the heart of a town, the cable car will bring you in 5 minutes to the top of the spectacular fortified bastillian bastion, on the Chartreuse range.

From the panoramic terrace, enjoy the unforgettable view of the town and look at the imposing range of mountains, especially "Mont Blanc".

***Dinner at "Chez le Per Gras"***, a renowned restaurant in Grenoble, at the top of the Bastille

<http://www.restaurant-grenoble-gras.com/>