

Preliminary Technical Program

Beneficiation of Phosphates IX

An ECI Conference Series

June 5 – 10, 2022

Helsinki, Finland

Chair

Dr. Patrick Zhang

**FIPR Industrial and Phosphate Research Institute
Florida Polytechnic University**

Co-Chairs

**Professor Jan Miller
University of Utah, USA**

**Professor. Laurindo Leal Filho
University of Sao Paulo, Brazil**

**Ms. Erika Rova
Yara International, Finland**

**Professor Andre Carlos Silva,
Federal University of Goiás, Brazil**

**Mr. Ewan Wingate
Bechtel Australia, Australia**



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Sunday, June 5, 2022

16:00 – 19:00	Registration
18:00 – 19:00	Welcome Reception
19:00 – 21:30	Dinner

Monday, June 6, 2022

- 07:00 – 08:30 Breakfast
- 08:30 – 08:40 **Welcoming Remarks**
Conference Co-Chair, Erika Rova, Yara International, Finland
- 08:40 – 08:50 **Opening Remarks**
Conference Chair, Patrick Zhang, FIPR Institute, Florida Polytechnic University, USA
- 08:50 – 09:00 **ECI & Vital Conference Information**
Kevin Korpics, ECI, USA
- 09:00 – 12:00 **Session I: Recovery of Critical Elements**
Session Co-chairs: James Mennie and Elves Matiolo
- 09:00 – 09:25 **Evaluation of critical materials in phosphogypsum stacks: the need for internationally accepted best practices**
Bernd Lottermoser, RWTH Aachen University, Germany
- 09:25 – 09:50 **Continuous Recovery of Phosphoric Acid and Rare-Earths Containing Particles from Phosphoric Acid Sludge Using a Decanter Centrifuge**
Costas Tsouris, Oak Ridge National Lab, USA
- 09:50 – 10:15 **Nanofiltration Membrane and Liquid Extraction for Rare Earth Separation from Phosphate Ore Waste of Djebel Onk Algeria**
Abderraouf Soukeur, Univ Rennes, France
- 10:15 – 10:45 Coffee Break
- 10:45 – 11:10 **Challenges and limitations of processing carbonatite rare earths deposits in Brazil**
Elves Matiolo, Centro de Tecnologia Mineral, Brazil
- 11:10 – 11:40 **Flotation of apatite and REEs as co-products from a Vietnamese sedimentary phosphate ore rich in carbonate and finely intergrowth**
Huu Duong HOANG, Maelgwyn Mineral Services Ltd, Vietnam
- 11:40 – 12:05 **Rare Earths in Phosphate: Occurrence, Significance and Opportunities for Recovery**
Patrick Zhang, FIPR Institute, Florida Polytechnic University, USA
- 12:05 – 13:30 **Lunch**
- 14:00 – 17:40 **Session II: Advances in Reagent Development**
Session Co-Chairs: Franciele Lima and Guoxin Wang
- 14:00 – 14:25 **Atrac® 922 collector for phosphate flotation, jointly developed by Nouryon and Yara, yields high performance and reduces environmental impact**
Henrik Nordberg, Nouryon Surface Chemistry, Sweden
- 14:25 – 14:50 **Characterization of fatty acid-based collectors vis-à-vis apatite flotation in basic medium**
Laurindo de Salles Leal Filho, Brazil
- 14:50 – 15:15 **New reagent scheme for processing Florida phosphate ores**
Guoxin Wang, Arkema-ArrMaz, USA
- 15:15 – 15:45 Coffee break
- 15:45 – 16:10 **Synergy of collectors for phosphate flotation in Serra do Salitre Complex**
Franciele Lima, Salitre Fertilizantes, Brazil
- 16:10 – 16:35 **Novel Reagents For The Beneficiation Of Various Phosphate Ores**
Suresh Raju Mudnuru, Clariant India Ltd., India

Monday, June 6, 2022 (continued)

- 16:35 – 17:00 **Prospects of development smart collectors for phosphorite flotation: nanoparticles-based collectors**
Salah Althyabat, Al-hussein Bin Talal University, Jordan
- 17:00 – 17:25 **Low Grade Igneous Phosphatic Rock Flotation Using Sorghum Starch as Depressor**
Elenice M. S. Silva, Federal University of Catalão, Brazil
- 19:00 – 20:30 Dinner
- 20:30 – 21:30 Social Hour

Tuesday, June 7, 2022

07:00 – 08:30	Breakfast
08:30 – 12:20	<u>Session III: Physical Separation and Process Analysis</u> Session Co-Chairs: Sahla Al-thyabat and Ashma Singh
08:30 – 08:55	Beneficiation of medium and low grade African phosphates in the context of stimulating supply Ashma Singh, Mintek, South Africa
08:55 – 09:20	The increasing usage of GEOSCAN online analysis in phosphate processing Luke Balzan, Scantech International, Australia
09:20 – 09:45	Mineral liberation using selective fragmentation of phosphate ore Lev Filippov, Universiyé de Lorraine, France
09:45 – 10:10	The run of mine grade is on target but the process plant is underperforming – what's the problem? Ewan Wingate, Bechtel Australia, Australia
10:10 – 10:50	Coffee break
10:50 – 11:15	Innovative Gravity Separation for Sustainable Utilization of Mineral Resources James Mennie, FIPR Institute, Florida Polytechnic University, USA
11:15 – 11:40	Beneficiation of phosphate ores using tribo-electrostatic separator Abhishek Gupta, ST Equipment & Technology, USA
11:40 – 12:05	Flotation processing of Elandsfontein sedimentary phosphate ore from South Africa Getrude Marape, Mintek, South Africa
12:05 – 13:30	Lunch
Afternoon	Free time Dinner on your own

Wednesday, June 8, 2022

- 07:00 – 08:30 Breakfast
- 08:30 – 12:00 **Session IV: Hydrometallurgical Processing**
Session Co-Chairs: Tibaut Theys and Laurin de Salles Leal Filho
- 08:30 – 09:00 **Phosphate Rock Beneficiation through Production of DCP “Super-Rock” as a Raw Material for Phosphoric Acid Plants**
Sébastien Havelange, Prayon Technologies, Belgium
- 09:00 – 09:30 **Foaming and Defoaming of the Wet Process Phosphoric Acid**
Pingkeng Wu, Arkema-ArrMaz, USA
- 09:30 – 10:00 **New insight on Titanium(IV) speciation in concentrated phosphoric acid**
Alexandre Chagnes, Université de Lorraine-Georessources, France
- 10:00 – 10:30 Coffee break
- 10:30 – 11:00 **New process to produce Di-calcium sulfate from low grade rock or tailing using diluted or by-product sulfuric acid**
Tibaut Theys, Prayon Technologies, Belgium
- 11:00 – 11:30 **Bioflotation of Apatite with *Saccharomyces Cerevisiae* in Hallimond Tube**
André Carlos Silva, Federal University of Catalão, Brazil
- 11:30 – 12:00 **Analysis of Different Schemes for Recovery of REE from Phosphoric Acid**
Patrick Zhang, FIPR Institute, Florida Polytechnic University, USA
- 12:30 – 14:00 Lunch
- 15:00 – 20:30 **Conference Excursion with dinner included**
Guided Tour of Helsinki until 17:15
At 17:30, board boat for cruise and tour with buffet dinner
Return to hotel approximately 20:30

Thursday, June 9, 2022

- 07:00 – 08:30 Breakfast
- 08:30 – 11:00 **Session V: Sustainability & the Environment**
Session Co-Chairs: Ewan Wingate and Henrik Nordberg
- 08:30 – 09:00 **Smart Road with Phosphogypsum as Road Base**
Gary Albarelli, FIPR Institute, Florida Polytechnic University, USA
- 09:00 – 09:30 **Contributions to a circular phosphate economy - Polyphosphate production in *Saccharomyces cerevisiae***
Jana Fees, Institute of Applied Microbiology, RWTH Aachen University, Germany
- 09:30 – 10:00 **Natural Alternative Source of Fatty Acids for Phosphate Rock Flotation**
André Carlos Silva, Federal University of Catalão, Brazil
- 10:00 – 10:30 Coffee break
- 10:30 – 11:00 **Apatite flotation from iron oxide apatite (IOA) tailings**
Rickard Jolsterå, Luossavaara-Kiirunavaara AB, Sweden
- 11:00 – 11:30 **Role of Phosphorus-arsenic interaction to the Toxicity and Mobilisation of Arsenic in the Environment**
Peiman Zandi, Yibin University, China
- 11:30 – 12:00 **Rare earths recovery and gypsum upgrade from Florida phosphogypsum**
Haijun Liang, Northeast University, China
- 12:00 – 13:30 Lunch
- 14:00 – 16:00 *Ad hoc* discussion on REE recovery
- 16:00 – 16:30 Coffee Break
- 19:30 – 22:00 Conference Banquet

Friday, June 10, 2022

07:00 – 08:30

Breakfast

Departures

June 10 – 11, 2022

For the Technical Excursion group: Trip to Siilinjärvi and tour of Yara phosphate complex (costs not included in the registration fee)