

Preliminary Technical Program

Beneficiation of Phosphates VIII

An ECI Conference Series

April 29 – May 4, 2018

Cape Town, South Africa

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

Mr. Marius Porteus
Foskor, South Africa

Professor Neil Snyders
Stellenbosch Univ., South Africa

Mr. Ewan Wingate
WorleyParsons, Australia

Professor Guven Akdogan
Stellenbosch Univ., South Africa



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Sunday, April 29, 2018

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|---------------|----------------------------------|
| 16:30 – 18:00 | Registration |
| 18:00 – 19:00 | Welcome Reception (Wine Tasting) |
| 19:00 – 20:30 | Dinner |

Monday, April 30, 2018

07:00 – 08:30

Breakfast

08:30 – 09:15

Keynote 1

Flotation in Seawater

Janusz Laskowski, University of British Columbia, Vancouver, Canada

Session I: Sustainability and the Environment

09:15 – 09:45

Resource-Saving Technology for Processing By-Products of the Wet Phosphoric Acid Process – Phosphogypsum and Fluosilicic Acid to Produce Ammonium Sulfate

Maksim Tcikin, The Research Institute for Fertilizers, Russia

09:45 – 10:15

Recovery of High Purity Calcium Sulfate from Phosphogypsum I: Thermodynamic Study of SO_4^{2-} Purification

Zeqiang Zhang, Wuhan Institute of Technology

10:15 – 10:45

Coffee break

10:45 – 11:15

Removal of Coarse Fraction from Phosphatic Clays for Clay Settling Area Reduction and Additional Phosphate

Charles Guan, Mosaic Fertilizer, LLC, Florida, USA

11:15 – 11:45

Heavy Metal Contamination and Health Risk Assessment in Waste Mine Water Dewatering Using Phosphate Beneficiation Processes in

Mohammad Salem Al-Hwaiti, Al-Hussein Bin Talal University, Jordan

11:45 – 12:15

Biotechnological Polyphosphate Production from Rape Seed

Jonas Christ, RWTH Aachen University, Germany

12:15 – 12:45

Upgrading Phosphogypsum for Uses as Construction Materials

Wending Xiao, Wuhan Institute of Technology, China

12:45 – 14:15

Lunch

Keynote 2:

14:30 – 15:15

The New Frontiers of Mineral Processing

Ruan Chi, Wuhan Institute of Technology

Session II: Comprehensive Extraction

15:15 – 15:45

Recovery of Rare Earths and P from Phosphate Flotation Tails

Haijun Liang, Northeastern University, China

15:45 – 16:15

Reprocessing of Phosphogypsum for Recovery of Rare Earths

Jason Yang, Geological Survey of Finland, Finland

Monday, April 30, 2018 (continued)

- 16:15 – 16:45 **The Recovery of Rare Earth Elements from Phosphate Rock and Phosphate Mining Waste Products Using A Novel Water-Insoluble Adsorption Polymer**
Joseph Laurino, Periodic Products, Inc., Florida, USA
- 16:45 – 17:15 Coffee break
- 17:15 – 17:45 **A Novel Process to Recover Sulfur, Lime and Rare Earths from Gypsum**
David van Vuuren, University of Pretoria, South Africa
- 17:45 – 18:15 **Hydrothermal Pre-Treatment Process of Phosphogypsum for Enhanced Rare Earths Recovery**
Eugene Lakay, Mintek, South Africa
- 18:15 – 18:45 **Simultaneous Recovery of Rare Earths and Uranium from Wet Process Phosphoric Acid Using Solvent Extraction with D2EHP**
Shengxi Wu, National Engineering Research Center for Rare Earth Materials, General Research Institute for Nonferrous Metals, Beijing, China
- 19:00 – 20:30 Dinner
- 20:30 – 21:30 Social Hour

Tuesday, May 1, 2018

- 07:00 – 08:30 Breakfast
- 08:30 – 09:15 **Keynote 3**
Surface Chemistry and Flotation Behavior of Monazite, Apatite, Ilmenite, Quartz, Rutile, and Zircon with Octanohydroxamic Acid
Corby Anderson, Colorado School of Mines, USA
- Session III: Flotation Fundamentals and Reagents**
- 09:15 – 09:40 **How to Truly Optimize Phosphate Flotation, When Feed Grade is Ever-changing**
Lucas R. Moore, ArrMaz, USA
- 09:40 – 10:05 **New Reagent Development for the Beneficiation of Various Phosphate Ores**
Pablo Dopico, Clariant Mining Solutions, USA
- 10:05 – 10:35 Coffee break
- 10:35 – 11:00 **Case Study for Processing Phosphate Ores Worldwide**
Guoxin Wang, ArrMaz, USA
- 11:00 – 11:25 **Evaluation of the Effect of Ca²⁺ Ion Concentration on Calcite Flotation of Santa Quitérias´S Ore Using Carbonic Gas**
Elves Matiolo, Centro de Tecnologia Mineral (CETEM), Brazil
- 11:25 – 11:50 **Investigation of the Mechanism of Apatite/Carbonates Separation in Acidic Flotation Process Using In Situ Raman Spectroscopy**
Lev Filippov, Université de Lorraine, France
- 11:50 – 12:15 **Formulation of a Reagent Used in a Process of Water Recovery the Sludge from Beneficiation Process of Phosphate Ore Using Mixture Design**
Mohammed EL ASRI, Sidi Mohamed Ben Abdellah University, Morocco
- 12:30 – 14:00 Lunch
- 14:00 – 18:30 Free time / Optional excursion(s)
- Dinner on your own

Wednesday, May 2, 2018

07:00 – 08:30

Breakfast

08:30 – 09:15

Keynote 4:

TBA

Jan Miller, University of Utah, USA

09:15 – 09:45

Session IV: : Flotation Fundamentals and Reagents Part 2

Tailoring Collectors to Allow for Sea Water Usage in Phosphate Beneficiation

Lucas R. Moore, ArrMaz, USA

09:45 – 10:15

The Surface Chemistry and Microflotation of Xenotime and Depression of Gangue Minerals

Corby Anderson, Colorado School of Mines, USA

10:15 – 10:45

Coffee break

10:45 – 11:15

Alternative Depressors in Floating Phosphate

André Carlos Silva, Federal University of Goiás, Brazil

11:15 – 11:45

Separation of Dolomite from Phosphate at Low Cost and Reduced Environmental Impact

Wending Xiao, Hubei Bonan Technology Co., Ltd, China

11:45 – 12:15

Using Two Alternative Vegetable Oil's as Collector in Apatite Froth Flotation

André Carlos Silva, Federal University of Goiás, Brazil

12:30 – 14:00

Lunch

14:00 – 19:00

Group Tour (City tour of Cape Town and trip up Table Mountain)

19:00 – 20:30

Off site dinner at Gold Restaurant

Thursday, May 3, 2018

07:00 – 08:30

Breakfast

Session V: Hydrometallurgy

08:30 – 09:15

Latest trend for Fluorine in the phosphoric industry: absorption efficiency improvement, conversion into raw material

Tibaut Theys, Prayon Technologies, Belgium

09:15 – 09:45

Can Your P₂O₅ Be Commercially Exploited

Michael E. Kelahan, Phosphate Consulting LLC, USA

09:45 – 10:15

Efficacious Remediation of Phosphoric Acid Plant Pond Water

Vaughn Astley, Dr Phosphate, Inc, USA

10:15 – 10:45

Coffee break

10:45 – 11:15

Revisiting the Merseburg Process: Economic Opportunity and Environmental Benefit?

Gary Albarelli, Florida Industrial and Phosphate Research Institute

11:15 – 11:45

Moving to The 20th Century!!! Advanced Process Controls for Phosacid Reactors and Filters. Alloy 31 Lining in Hemihydrate Reactors

Vaughn Astley, Dr Phosphate, Inc, USA

11:45 – 12:15

Recovery of Rare Earth Elements from Phosphate Rock by Hydrometallurgical Processes - A Critical Review

Shengxi Wu, National Engineering Research Center for Rare Earth Materials, General Research Institute for Nonferrous Metals, Beijing, China

12:15 – 13:30

Lunch

Session VI: Advances in Processing Technology and Equipment

14:00 – 14:30

Physical Separation of High Grade and Low Grade African Phosphates

Deepika Babu Dayal, Mintek, South Africa

14:30 – 15:00

Dry Rotary Triboelectrostatic Phosphate Ore Beneficiation

Dongping Tao, University of Science and Technology Liaoning, China

15:00 – 15:30

Evaluation of an Agua Resources-Três Estradas Brazilian Phosphate Ore Using Column Flotation

Andrew Hobert, Eriez Flotation Division, USA

15:30 - 16:00

Coffee break

16:00 – 16:30

Influence of the Impeller Speed on Phosphate Rock Flotation

André Carlos Silva, Federal University of Goiás, Brazil

16:30 – 17:00

Successful Applications of Vertical-Roller-Mills in Phosphate Processing

Jonathan Smith, Loesche South Africa, South Africa

Thursday, May 3, 2018 (continued)

- 17:00 – 17:30 **The Application of Dense Medium Separation for Monazite Beneficiation**
Uwais Ahmed,
- 17:30 – 18:00 **The Fundamentals, Unique Features and Performance of A Newly Improved Packed Column Jig for Phosphate Processing**
Wending Xiao, Wuhan Institute of Technology, China
- 18:00 – 18:30 **Milling of the Phosphate Rock Flotation Circuit Circulating Load Aiming Production Increase and Iron Content Reduction in the Final Concentrate**
André Carlos Silva, Federal University of Goiás, Brazil
- 19:30 – 21:30 Banquet

Friday, April 4, 2018

- 07:00 – 08:30 Breakfast
- Departures