

Beneficiation of Phosphates VII

**Melbourne, Australia
29 March – 3 April 2015**

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Sunday, March 29, 2015

16:00 - 19:00	Conference check-in (Function Foyer)
18:00 - 19:00	Welcome Reception
19:00 - 21:00	Dinner

Notes

- *All technical sessions will be in Parkside Room B.*
- *Meal locations will be announced on site.*
- *No recording, please! The use of any devices to capture images (e.g., camera or camera phones) or sound (e.g., tape and digital recorders) is strictly prohibited at all technical and poster sessions without the express written consent, obtained in advance, from ECI.*
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- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*

Monday, March 30, 2015

06:30 - 08:30 Breakfast

Opening Remarks

08:30 - 08:35 **Conference Chair: Patrick Zhang**, Florida Industrial and Phosphate Research Institute, USA

Welcoming Remarks

08:35 - 08:45 **ECI Liaison: Alan Hatton**, Massachusetts Institute of Technology, USA

08:45 - 08:55 **Ewan Wingate**, WorleyParsons Services Pty Ltd., Australia

Session I: Comprehensive Extraction

Session Co-Chairs: Abdelaali Kossir, OCP Group, Morocco
Gary Albarelli, Florida Industrial and Phosphate Research Institute, USA

Keynote 1:

08:55 - 09:35 **Smart, sustainable development of phosphate resources: The prospects of phosphogypsum utilization and uranium recovery 1**
Julian Hilton, Aleff Group, United Kingdom

09:35 - 10:05 **Recovery of REE from an apatite concentrate in the nitrophosphate process of fertilizer production 29**
Mahmood Alemrajabi, Royal Institute of Technology (KTH), Sweden

10:05 - 10:35 **There and back again 2.5: Who did what in solvent extraction - a demonstrated and proven technology for uranium recovery from phosphoric acid 37**
Vaughn Astley, Dr. Phosphate, Inc., USA

10:35 - 11:05 Coffee break

11:05 - 11:35 **Enrichment of rare earth elements from Florida phosphate flotation tailings N/A**
Yan Wu, China University of Geosciences, China

11:35 - 12:05 **Rare earths and the recovery of administratium from phosphates 56**
Vaughn Astley, Dr. Phosphate, Inc., USA

12:05 - 12:35 **Upgrading phosphate flotation tailings for rare earths extraction 69**
Salah Al-Thyabat, Al-Hussein Bin Tall University, Jordan

12:35 - 14:15 Lunch

Monday, March 30, 2015 (continued)

Session II: Process Innovation

Session Co-chairs: Laurindo Leal Filho, Vale Technological Institute, Brazil
Arafat Ghosheh, Saudi Arabian Mining Co. Ma'Aden, Saudi Arabia

Keynote 2:

- 14:30 - 15:15 **The surface and colloid chemistry of layered silicate minerals 83**
Jan Miller, University of Utah, USA
- 15:15 - 15:45 **Tenova Bateman technologies: Tailor made approaches for mechanical
beneficiation of phosphate rock N/A**
Leonid Lisiansky, Tenova Bateman Technology, Israel
- 15:45 - 16:15 Coffee break
- 16:15 - 16:45 **Water quality effect in phosphate flotation: Understanding leads to
overcoming N/A**
Lucas R. Moore, ArrMaz, USA
- 16:45 - 17:15 **An alternative flotation process for apatite concentration of the Itataia
carbonaceous uranium-phosphate ore 109**
Elves Matiolo, Centro de Tecnologia Mineral, Brazil
- 17:15 - 17:45 **Study on mineral processing of a medium to low grade phosphate ore N/A**
Mei Yang, China University of Geosciences, China
- 17:45 - 18:15 **Application of pico-nano bubble generator in phosphate reverse flotation N/A**
Guoxin Wang, ArrMaz, USA
- 18:30 - 20:30 Dinner
- 20:30 - 21:30 Social Hour

Tuesday, March 31, 2015

06:30 - 08:30 Breakfast

Session III: Flotation Reagents

Session Co-Chairs: Chaucer Hwang, Mosaic Company, USA
Gerald Heebner, Arizona Chemicals, USA

Keynote 3:

08:30 - 09:15 **The effect of dissolution kinetics on flotation response of apatite with sodium oleate N/A**

Laurindo Leal Filho, Vale Technological Institute, Brazil

09:15 - 09:45 **Application of Custofloat® carbonate collectors in beneficiating phosphate ores in China 127**

Guoxin Wang, ArrMaz, USA

09:45 - 10:15 **Processing Florida dolomitic phosphate pebble with Custofloat® carbonate collectors 135**

Guoxin Wang, ArrMaz, USA

10:15 - 10:45 Coffee break

10:45 - 11:15 **Improvement of dolomite collector on high magnesium pebble sample from Florida N/A**

Patrick Zhang, Florida Industrial and Phosphate Research Institute, USA

11:15 - 11:45 **Opportunities for flocculation/flotation treatment of phosphate slimes using temperature responsive reagents N/A**

Elizaveta Forbes, CSIRO, Australia

11:45 - 12:15 **Phosphate beneficiation with novel collectors for direct and reverse flotation: Beyond low cost fatty acids 143**

Pablo Dopico, Clariant Mining Solutions, USA

12:15 - 12:45 **The use of lanthanum (La⁺³) and Cerium (Ce⁺³) ions as phosphate activators in low grade phosphate flotation 155**

Salah Al-Thyabat, Mining Engineering Department, Al-Hussein Bin Talal University-Jordan, Jordan

12:45 - 14:15 Lunch

14:15 Optional excursion(s)

Dinner on own

Wednesday, April 1, 2015

06:30 - 08:30 Breakfast

Session IV: Processing Equipment

Session Co-Chairs: Jaisen Kohmuench, Eriez Flotation Division, USA
Abdelhak Kabbabi, OCP Group, Morocco

Keynote 4:

08:30 - 09:15

Advances in particle characterization for improved mineral processing technology N/A

Jan D. Miller, University of Utah, USA

09:15 - 09:45

Column flotation of phosphate ore – An engineer’s perspective 164

Ewan Wingate, WorleyParsons, Australia

09:45 - 10:15

Phosphate In Australia – So Near Yet So Far 175

Ewan Wingate, WorleyParsons, Australia

10:15 - 10:45

Coffee break

10:45 - 11:15

Gravitational separation behavior of collophanite from dolomite in a packed column jig N/A

Wending Xiao, China University of Geosciences, China

11:15 - 11:45

Pilot testing and feasibility analysis of deep cone thickening for Florida phosphate clay (slime) N/A

Chaucer Hwang, The Mosaic Company, USA

11:45 - 12:15

Application of classification and fluidized-bed flotation at PCS aurora N/A

George Piegols, PCS Phosphate, USA

12:15 - 12:45

Understanding the comminution mechanism of high-pressure grinding rolls: Lower cost, higher efficiency and selectivity 182

Francisco Sotillo, PerUsa EnviroMet, Inc., USA

12:45 - 14:15

Lunch

14:15

Group tour

19:00 - 21:00

Dinner

21:00 - 22:00

Social Hour

Thursday, April 2, 2015

06:30 - 08:30 Breakfast

Session V: Hydrometallurgy

Session Co-Chairs: Vaughn Astley: Dr. Phosphate, Inc., USA
Tibaut Theys, Prayon Technologies, Belgium

08:30 - 09:15

Keynote 5:

Research progress on the production of industrial phosphoric acid and downstream phosphates from wet-process phosphoric acid in China N/A
Yuanxin Wu, Wuhan Institute of Technology, China

09:15 - 09:45

Newcomer in phosphoric acid process routes the DA-HF process ensures 2 to 3 % of efficiency increase compared to a standard dihydrate plant with a limited number of extra equipment 193
Tibaut Theys, Prayon Technologies, Belgium

09:45 - 10:15

Acidulation of low grade collophanite using HCL for production of dihydrate gypsum whisker and effective compound fertilizer N/A
Wending Xiao, China University of Geosciences (Wuhan), China

10:15 - 10:45

Coffee break

10:45 - 11:15

Alloy 31 lining in hemihydrate reactors N/A
John Pannia, IPL Phosphate Hill, Australia

11:15 - 11:45

P₂O₅ reclamation from gypsum sacks N/A
Casey R. Hiette, IPL Phosphate Hill Operations, Australia

11:45 - 12:15

Improvement of valves and pumps for the phosphoric reactor circuit. N/A
Matthew Johnson, Incitec Pivot Limited, Australia

12:15 - 12:45

Environmentally friendly, energy efficient slurry handling by MULTISAFE double hose-diaphragm pumps N/A
Alan Frost, FELUWA Pumpen Australia, Australia

12:45 - 14:45

Lunch

Thursday, April 2, 2015 (continued)

Session VI: Waste Utilization and the Environment

Session Co-Chairs: Julian Hilton, Aleff Group, United Kingdom
Salah Al-Thyabat, Al-Hussein Bin Talal University, Jordan

- 15:00 - 15:30 **Overcoming the regulatory hurdles to recovering rare earths from phosphate** N/A
Gary Albarelli, Florida Industrial and Phosphate Research Institute, USA
- 15:30 - 16:00 **An optimized approach to phosphate recovery** N/A
Jaisen Kohmuench, Eriez Flotation Division, USA
- 16:00 - 16:30 **Recovery of rare earths from Florida phosphogypsum** N/A
Patrick Zhang, Florida Industrial and Phosphate Research Institute, USA
- 16:30 - 17:00 Coffee break
- 17:00 - 17:30 **Environmental protection : An imperative of sustainable development in phosphate industry** N/A
Abdelhak Kabbabi, OCP Group S.A., Morocco
- 17:30 - 18:00 **Phosphorus removal and recovery from waste water by bio-processing followed by microwave radiation** N/A
Patrick Zhang, Florida Industrial and Phosphate Research Institute, USA
- 18:00 - 18:30 **Recovery of sulphur values from phosphogypsum: A historical review and prospects for the future** N/A
Gary Albarelli, Florida Industrial and Phosphate Research Institute, USA
- 19:30 - 22:00 Banquet

Friday, April 3, 2015

06:30 - 08:30 Breakfast

Session VII: Analysis and Control

Session Co-Chairs: Wending Xiao, China University of Geosciences, China
Michael Gaft, Laser Distance Spectrometry (LDS), Israel

09:00 - 09:30 **ReLIBS (Remote Laser Induced Breakdown Spectroscopy) – Industrial online analyzer for phosphate industry** N/A
Michael Gaft, Laser Distance Spectrometry (LDS), Israel

09:30 - 10:00 **The use of advanced process controls in a phosphoric acid reactor** 208
Vaughn Astley, Dr Phosphate, Inc., USA

10:00 - 10:30 Coffee break

10:30 - 11:00 **Suitability of Geoscan-M elemental analyser for phosphate rock** 235
Derek Griffiths, Scantech International Pty Ltd, Australia

11:00 - 11:30 **The impact of an increase in potassium content in the rock feed on the operation of the Phosphate Hill hemihydrate phosphoric acid plant** N/A
Gerhardus C. Du Plessis, Incitec Pivot Ltd, Australia

11:30 - 12:00 **Optimization of Jordanian phosphate flotation by artificial neural network (ANN)** N/A
Salah Al-Thyabat, Al-Hussein Bin Talal University, Jordan

12:00 Lunch and departures