

Program

Beneficiation of Phosphates IV

December 5-10, 2004

**Wyndham Miami Beach Resort
Miami Beach, Florida
4833 Collins Avenue
Miami Beach, FL 33140, USA
P: 1-305-532-3600
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Conference Chair

Patrick Zhang
Florida Institute of Phosphate Research

Conference Co-Chairs

Hassan El-Shall
Particle Engineering Research Center, University of Florida

Jan Miller
University of Utah

Regis Stana
R. Squared S., Inc.

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Sunday, December 5, 2004

16:00 – 18:30	Registration
18:30 – 19:00	Welcome Reception (Vista Room)
19:00 – 20:30	Opening Dinner (Vista Room)
20:15 – 20:45	Co-Chairs' Messages Hassan El-Shall, Jan Miller, Regis Stana

NOTES

- ? **All technical sessions will be held in The Mediterranean Center**
- ? **All Breakfasts will be in the Oceanview Lounge. Other meal locations are listed throughout the program.**

- ? **Please observe “No Smoking” at ECI technical sessions, meals and social hours.**
- ? **Speakers should allow time at the end of their presentation for questions and discussion.**
- ? **Please silence your cell phone during sessions.**

Monday, December 6, 2004

07:30 – 08:45 Breakfast

08:45 – 09:00 Opening Remarks
Patrick Zhang, Florida Institute of Phosphate Research
P. Somasundaran, ECI Liaison

Session I: Theoretical Understanding

Session Co-Chairs: Karen Mikkola, Mosaic Company, USA

Laurindo Leal Filho, University of Sao Paulo, Brazil

09:00 – 10:00 Keynote Lecture #1:
The Critical Roles of Surface Heterogeneity, Hydrodynamics, and Interfacial Chemistry in Selective Solid-Liquid Separation
John Ralston
Ian Wark Research Institute, University of South Australia

10:00 – 10:30 **Optimization Criteria for Phosphate Beneficiation**
Gerald H. Luttrell¹, Jaisen N. Kohmuench² and Michael J. Mankosa²
¹Center for Advanced Separation Technologies, Virginia Tech
²Eriez Manufacturing

10:30 – 11:00 Coffee Break

11:00 – 11:30 **Selective Adsorption of Starches Onto Ca-Bearing Surfaces**
Armando C. Araujo¹, Antonio E. C. Peres¹, Rogerio C. Guimarães²
¹Federal University of Minas Gerais – UFMG, Brazil
²Bunge Fertilizantes SA, Av. Arafertil, Brazil

11:30 – 12:00 **The Role of Hydrodynamics In Coarse Apatite Flotation**
Laurindo de Salles Leal Filho¹, Wendel Johnson Rodrigues¹, Odair Alves de Lima¹, Luiz Antônio Fonseca de Barros²
¹University of Sao Paulo, Brazil
²Fosfertil SA, Brazil

12:00 – 12:30 **Mechanisms Involved In Reactive Flotation of Dolomite**
A. El-Midany¹, H. El-Shall¹, R. Stana¹, and P. Somasundaran²,
¹University of Florida, USA
²Columbia University, USA

12:30 – 13:00 Discussion

13:00 – 14:00 Lunch (Grand Promenade)

14:00 – 19:00 *ad hoc* sessions/free time

19:00 – 20:30 Dinner (Vista Room)

20:30 – 21:30 Social Hour (Vista Room)

Tuesday, December 7, 2004 (Continued)

Session III: Technology Innovations A: Reagents

Session Co-Chairs: Gerald Luttrell, Virginia Tech, USA

Crystyna Cedzyska, Tech. Uni. Lodz, Poland

- 14:30 – 15:00 **Hidroveg Chemicals and Their Efficiency In American Phosphate Rock Flotation**
J. W. Schlanz¹ S. C. A. Franca²
¹North Carolina State University, USA
²Center for Mineral Technology, Brazil
- 15:00 – 15:30 **Pilot-Plant Evaluation of a Water Insoluble Hydroxamic Acid Collector for Single Stage Flotation of Florida Phosphate Rock**
X. Wang and J. D. Miller
University of Utah, Salt Lake City, USA
- 15:30 – 16:00 **Updating the Knowledge of Amine Flotation in Phosphate Processing: II. Effect of Particle Size**
Francisco Sotillo¹, Patrick Zhang², and Robert Snow²
¹PerUsa EnviroMet
²Florida Institute of Phosphate Research
- 16:00 – 16:30 Coffee Break
- 16:30 – 17:00 **The History of Traditional Lignosulfonates in Mineral Processing, and New Opportunities for Chemically Modified Lignin Products**
Jerry Gargulak
LignoTech, USA
- 17:00 – 17:30 **Challenging the Crago “Double Float” Process IV – Selectivity Enhancement in All-Anionic Flotation of Florida Phosphates**
Robert Snow and Patrick Zhang
Florida Institute of Phosphate Research
- 19:30 – 21:00 Dinner (Grand Promenade)
- 21:00 – 22:00 Social Hour (Grand Promenade)

Wednesday, December 8, 2004

07:30 – 08:45 Breakfast

Session IV: Processing of Complex Ores

Session Co-Chairs: David Gossett, CF Industries, USA

Rawya Rifaat, Agrium, Canada

09:00 – 09:30 **Beneficiation of Sedimentary Dolomitic Phosphate Ore by Dense Medium Separation and Flotation**

Zhengxing Gu, Shibo Zheng and Xianjun Cao
CLDRI, China

09:30 – 10:00 **Novel Microorganisms in Apatite and Calcite Processing**

R. W. Smith¹, M. S. Miettinen²

¹University of Nevada, Reno, USA

²Geological Survey of Finland, Outokumpu, Finland

10:00 – 10:30 **Carbonate Separation from Sedimentary Phosphates Through Bio-Flotation**

N. A. Abdel-Khalek¹, S. Farrah², H. El-Shall², M. A. Abdel-Khalek¹, A. M. El-Mahdy¹, S. E. El-Mofty³, and D. Elgillani³

¹Central Metallurgical Research and Development Institute, Cairo, Egypt

²University of Florida, Gainesville, FL, USA

³Cairo University, Giza, Egypt

10:30 – 11:00 Coffee Break

11:00 – 11:30 **Mineral Processing of Phosphate Rock at Agrium Kapuskasing Phosphate Operations**

Rawya Rifaat

Agrium Inc., Canada

11:30 – 12:00 **Beneficiation Studies on Silicate-Carbonate Phosphate Ores in China**

Zheng Shibo, Cao Xianjun, Ge Zhaomin, Song Wenyi

CLDRI, China

12:00 – 12:30 Discussion

12:30 – 13:30 Lunch (Starlight Roof Ballroom)

13:30 – 19:00 Excursion to Florida Keys

19:00 – 20:30 Dinner (Starlight Roof Ballroom)

20:30 – 21:30 Social Hour (Starlight Roof Ballroom)

Thursday, December 9, 2004

07:30 – 08:45 Breakfast

Session V: Hydrometallurgical Processing

**Session Co-Chairs: Vaughn Astley, Mosaic Company, USA
Regis Stana, R Squared S, Inc., USA**

09:00 – 09:30 **In-Situ Mining of Phosphate Ores**
R. Stana, A. El-Midany, and H. El-Shall
University of Florida, USA

09:30 – 10:00 **Study on Making Phosphoric Acid from Seabed Phosphorite by Wet
Process**
Shen Shifu, Han Yuexin, Sun Chuanyao
Northeastern University, Shenyang, China

10:00 – 10:30 **Struvite – A Possible Solution to the High-Mag Rock?**
H. El-Shall¹, B. Bandyopadhyay², E. Abdel Aal³, and R. Stana¹
¹University of Florida
²St. Fe. Community College
³Central Metallurgical Research and Development Institute (CMRDI), Helwan,
Cairo, Egypt

10:30 – 11:00 Coffee Break

11:00 – 11:30 **An Electrochemical Study of Metal Wear of Phosphate Grinding Mill**
D. Tao, G.L. Chen and B.K. Parekh
University of Kentucky, Lexington, USA

11:30 – 12:00 **Uranium From Phosphoric Acid – Is It Time (Again)?**
Dustin J. Garrow
International Nuclear, Inc., Golden, Colorado, USA

(Optional)

**Phosphatic Clay Disposal, Treatment and Utilization in Florida: A Review of
Industry Practices and Research**
Patrick Zhang
Florida Institute of Phosphate Research, USA

12:00 – 12:30 Discussion

12:30 – 13:30 Lunch (Grand Promenade)

13:30 – 17:00 *ad hoc* sessions/free time

Thursday, December 9, 2004 (Continued)

Session VI: Technology Innovations B: Processing

Session Co-Chairs: Mike Mankosa, Eriez Magnetics, USA

Vusi Mchunu, Ind. Olochemical, South Africa

- 17:00 – 17:30 **Column Flotation: A Key to the Production of Apatite Concentrates from Slimes**
Rogerio C. Guimarães², Antonio E. C. Peres¹, Armando C. Araujo¹
¹Federal University of Minas Gerais – UFMG, Brazil
²Bunge Fertilizantes SA, Av. Arafertil, Brazil
- 17:30 – 18:00 **Crystal Structure of Natural and Separated Phosphorite for Burenkhaan Deposit in Mongolia and their Mechanochemistry**
J.Amgalan¹, K. Maam¹, G.Batdemberel²
¹Institute of Chemistry and Chemical Technology of the MAS
²Mongolian University of Science and Technology
- 18:30 – 19:00 **Pilot-Scale Testing of Phosphate Flotation Processes Using Anionic Reagents**
Glenn Gruber
Jacobs Engineering, Lakeland, Florida, USA
- 19:00 – 19:30 **Electrostatic Beneficiation of Phosphate Ore**
Caibin Wu, Patrick Zhang (Substitute Presenter)
¹East China Jiaotong University, Nanchang, China
²Florida Institute of Phosphate Research, USA
- 19:30 – 21:30 Conference Banquet (Vista Room)
- 21:30 – 22:30 Social Hour (Vista Room)

Friday, December 9, 2004

- 07:30 – 08:45 Breakfast
- Session VII: Process Analysis and Control**
Session Co-Chairs: Joe Shoniker, PCS Phosphates, USA
Michael Gaft, ITL, Israel
- 09:00 – 09:30 **An Evaluation Criterion for Florida Phosphate Flotation Results**
Charles Guan
IMC Phosphates, Florida, USA
- 09:30 – 10:00 **Laser-Induced Breakdown Spectroscopy for Minerals Sorting in Phosphates Mining Industry**
M. Gaft, I. Shapir-Sofer, H. Modiano, M. Brestel
International Technologies Lasers (ITL), Israel
- 10:00 – 10:30 **Process Nuclear Magnetic Resonance (NMR) Analyzers – Benefits for Phosphate Beneficiation Plants**
Vaughn E. Davis
Progression, Inc., USA
- 10:30 – 11:00 Coffee Break
- 11:00 – 11:30 **New On-Stream Slurry Particle Sizer**
Jarmo Aaltonen¹, Matti Kongas², Kari Saloheimo²
¹Kemira GrowHow, Finland
²Outokumpu Technology, Minerals, Finland
- 11:30 – 12:00 **Vision Technology Applied to Phosphate Flotation**
Andrew Clarke
Minnovex Chile Limitada, Chile
- 12:00 – 12:30 **Beneficiation Automatic Control System: The Next Generation**
Regis Stana
R. Squared S., Inc., USA
- 12:30 – 12:45 Closing Remarks
Paul Clifford and Patrick Zhang, Florida Institute of Phosphate Research
- 12:45 – 13:30 Lunch (Grand Promenade) and Departure