Program

Metal Separation Technologies III

Symposium in Honor of Professor Lauri E. Holappa
of the Helsinki Institute of Technology

Copper Mountain, Colorado
June 20-24, 2004

Conference Chair
Seshadri Seetharaman
Royal Institute of Technology, Sweden

Conference Co-Chairs
Alan W. Cramb
Carnegie Mellon University, USA

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Sunday, June 20, 2004

16:00 – 18:00  Registration
18:00 – 18:30  Reception
18:30 – 19:30  Dinner
19:30 – 20:30  Social Hour

NOTES

• 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 cell phones at all technical sessions.
Monday, June 21, 2004

07:30 – 08:30 Breakfast

Session Chairs: K. C. Mills & J. W. Evans

Plenary Session

08:30 T. Emi, Yonsei University, Korea
Changing Paradigm of Metal Separation Technology for Steel Production

09:00 A. W. Cramb, Carnegie Mellon University, USA
Observation and Measurement of Bubble Separation at Liquid Steel-Slag Interfaces

09:30 Coffee and Tea

General Metallurgy I

10:00 L. E. Holappa, Helsinki University of Technology, Finland
Glimmers of Research in Metallurgy

10:30 R. Boom, Delft University of Technology, Netherlands
Metal Refining with Fractional Crystallization: State-of-the-art and future prospects

11:00 P. Taskinen, Outokumpu Research Oy, Finland
Industrial Slag Chemistry- A Case Study of Computational Thermodynamics

11:30 Stretch Break

Session Chairs: R. Boom & V. Sahajwalla

Fundamentals of Pyrometallurgy I

11:45 F. Kongoli, FLOGEN Technologies Inc., Canada
Thermodynamic Models for Phase Separation Processes: An Analysis and Critical Review

12:15 M. Bobadilla, IRSID – ARCELOR, France
General Thermodynamic Description of Liquid Steels by the “Central Atoms” Model

12:45 T. Miki, Tohoku University, Japan
Formulation on Deoxidation Equilibria of Molten High Alloys with Quadratic Formalism and Redlich-Kister Type Polynomial

13:15 Lunch

ad hoc Sessions / Free time

Session Chairs: A. W. Cramb & M. Gaune-Escard

Iron and Steelmaking I

17:30 K. Nagata, Tokyo Institute of Technology, Japan
Rapid Pig-Iron Making from Iron Ore Powder at Low Temperature
Monday, June 21, 2004 (continued)

18:00  H. Saxén, Åbo Akademi University, Finland
       Dynamic Model of Liquid Levels in the Blast Furnace Hearth

18:30  K. Naito, Nippon Steel Corporation, Japan
       Recent Change in Refining Process in Nippon Steel Corporation and the
       Metallurgical Phenomenon in the New Process

19:00  V. Seshadri, Universidade Federal de Minas Gerais, Brazil
       Physical Modeling Simulations of Refining Processes in Brazilian Steel Industry

19:30  Dinner

21:00  Poster Session and Social Hour
Tuesday, June 22, 2004

07:30 – 08:30 Breakfast

Session Chairs: L. E. Holappa & H. G. Lee

Plenary Session

08:30  
J. W. Evans, University of California - Berkeley, USA  
Copper Electrodeposition onto extended Surface Area Electrodes and the Treatment of Copper Containing Waste Streams

09:00  
M. Gaune-Escard, Ecole Polytechnique, France  
Thermodynamics of Lanthanide Halides and Application to High Temperature Processes

09:30  
Coffee and Tea

Molten Salt Technologies

10:00  
T. Tanaka, Osaka University, Japan  
Evaluation of Surface Properties of Liquid Alloys and Molten Ionic Mixtures for Metals Separation Technology

10:30  
R. G. Reddy, University of Alabama, USA  
Aluminum Electrolysis in Ionic Liquids at Low Temperature

11:00  
B. Mishra, Colorado School of Mines, USA  
Separation of Reactive Metals Using Molten Salt Processes

11:30  
Stretch Break

Session Chairs: P. Hayes & T. Tanaka

General Metallurgy II

11:45  
H. Jalkanen, Helsinki University of Technology, Finland  
Thermodynamic Modeling of Ammoniacal Nickel Sulphate Solutions

12:15  
P. Scheller, Freiberg University of Mining and Technology, Germany  
Network Between Metallurgy of Steel and Zinc

12:45  
S. Seetharaman, Royal Institute of Technology, Sweden  
Hydrogen Reduction of Complex Oxides- A novel Route Towards the Production of Nano-Grained Alloys and Intermetallics

13:15  
Lunch

Conference Excursion

18:00  
Dinner

Session Chairs: K. Nagata & R. I. L. Guthrie
Fundamentals of Pyrometallurgy II

19:00  **S. Sun**, CSIRO Mineral, Australia
Critical Condition for Slag Droplet Entrainment in Liquid Metal - A study on Liquid Silver and Alkali Borate Melts at 1000 °C

19:30  **C. Pistorius**, University of Pretoria, South Africa
Kinetics of Carbothermic Reduction Reactions under Heat Transfer Control

20:00  **K. Morita**, The University of Tokyo, Japan
Interfacial Reaction of Nitrogen with Molten Fe-S Alloys

20:30  **M. Görnerup**, Royal Institute of Technology, Sweden
Foam in Pyrometallurgy

21:00  Social Hour
Wednesday, June 23, 2004

07:30 – 08:30 Breakfast

Session Chairs: K. Osseo-Asare & Du Sichen

Plenary Session

08:30  R.I.L. Guthrie, McGill University, Canada
       Modelling Shrouded Supersonic Jets in BOF Steelmaking

09:00  M. Hasegawa, Kyoto University, Japan
       Activities of Phosphorous in Copper, Nickel and Cobalt

09:30  Coffee and Tea

Iron and Steelmaking II

10:00  J. Härkki, University of Oulu, Finland
       Effect of Fluid Flows on Refractory Wear in AOD

10:30  V. Sahajwalla, University of New South Wales, Australia
       Carbon/slag Interactions During Metal Processing: Wettability and Reactivity Investigations

11:00  P. Jönsson, Royal Institute of Technology, Sweden
       Presence of Metal Droplets in Slags and their Importance During Ladle Treatment

11:30  Stretch Break

Session Chairmen: S. Sun & J. Zhang

Iron and Steelmaking III

11:45  K. C. Mills, Imperial College, UK
       Metal Separation Problems in the Continuous Casting of Steel: A Review

12:15  K. Mukai, Kyushu Institute of Technology, Japan
       Motion of Fine Particles in Liquid Caused by Interfacial Tension Gradient in Relation to Metal Separation Technologies

12:45  J. A. G. Gncechi, Instituto Tecnologico de Morelia
       Design and Construction of a Pilot Scale Solid/Liquid Separation Plant for Electrical Impedance Measurements

13:15  Lunch

ad hoc Sessions / Free time

16:30  Poster session
Wednesday, June 23, 2004 (continued)

Session Chairs: H. Jalkanen & M. Görnerup

Inclusions I

17:30
Du Sichen, Royal Institute of Technology, Sweden
Formation and Chemical Development of Non-metallic Inclusions in Steel in Ladle Treatment

18:00
S. Sridhar, Carnegie Mellon University, USA
Separation of Al₂O₃ Inclusions Across Interfaces Between Molten Steel and Ladle-, Tundish- and Mold-Slags

18:30
H. G. Lee, Pohang University of Science and Technology, Korea
Inclusion Control in Steels Containing Si, Mn, Ti, Mg and/or Al: Thermodynamic Prediction and Experimental Confirmation

19:00
M. K. Cho, Yonsei University
Thermodynamic Behavior of Nickel, Cobalt and Phosphorus in CaO-SiO₂-FeO/MnO-(MgO) Slag System

19:30
Dinner

21:00
Poster Session and Social Hour
Thursday, June 24, 2004

07:30 – 08:30 Breakfast

Session Chairs: P. Taskinen & R. E. Aune

Prof. Takeda Memorial Session

08:30
K. Nagata, JSPS, Japan

08:40
P. Kongoli, FLOGEN Technologies Inc., Canada

08:50
M. Sanchez, Universidad de Concepcion, Chile

Plenary Session

09:00
M. Sanchez, Universidad de Concepcion, Chile
Direct Reduction of Chilean Copper Slags: A Waste Treatment Project Process

09:30
K. Osseo-Asare, Pennsylvania State University, USA
Complex Liquids in Solvent Extraction: Extractants and Microemulsions, Polymers and Aqueous Two-Phase Systems

09:00 Coffee and Tea

09:00
M. Sanchez, Universidad de Concepcion, Chile
Direct Reduction of Chilean Copper Slags: A Waste Treatment Project Process

09:30
K. Osseo-Asare, Pennsylvania State University, USA
Complex Liquids in Solvent Extraction: Extractants and Microemulsions, Polymers and Aqueous Two-Phase Systems

10:00 Coffee and Tea

Session Chairs: J. Härkki & P. Scheller

Non-Ferrous Extraction Metallurgy

10:30
P. C. Hayes, The University of Queensland, Australia
Kinetics of Reduction of Lead Smelting Slags With Solid Carbon

11:00
J. Zhang, University of Science & Technology Beijing, China
A Process Analysis of Pierce-Smith Converter

11:30
R. H. Eric, University of the Witwatersrand, South Africa
Separation, Settling and Flow Phenomena in Electric Matte Smelting of Cu-Ni Concentrates

12:00 Stretch Break

12:15
K. Yamaguchi, Iwate University, Japan
Phase Equilibrium and Thermodynamics Properties of SiO$_2$-CaO-FeO$_x$ Slags for Copper Smelting – Research Achievements of Prof. Yoichi Takeda

12:45 Conference Close

13:15 Lunch