

Program “Silicon for the Chemical and Solar Industry, 2014”

June 23, 2014

Monday June 23

- 1700 – 1900 Registration at Rica Nidelven
1900 Reception and Dinner

Tuesday June 24

- 0830 – 0845 Opening

Silicon Production

- 0845 – 0910 Jacob Steinmo, *Finnfjord AS*, “Energy Efficient Production of Silicon Based Alloys”
0910 – 0935 Eli Ringdalen, *SINTEF*, “Quartz Properties in the Silicon Production”
0935 – 1000 Merete Tangstad, Michael Ksaizek, Jan Erlend Andersen, *NTNU*, “Zones and Materials in the Silicon Furnace”
1000 – 1030 Coffee Break. Conference photo is taken
1030 – 1055 Willem van Noorth, P. van der Stap and J. van der Waal, *NEM & Sunrise Industries*, “Silicon Milling & Explosion Prevention”
1055 – 1120 John Fenger, *Thorsil*, “A New Age in Silicon Production”
1120 – 1135 Break
1135– 1200 Lou Parous, Frank Weber, Wolfgang Herbst, *Viridis iQ GmbH*, “Revisiting Silicon Atomization: Potential Cost Savings for the Photovoltaic Industry”
1200 – 1225 Rolf Degel, Michael Kalisch, Erik Hecker, Harmen Oterdoom, James Brosnan, *SMS – Siemag*, “Innovative Electric Smelter Solutions of the SMS Group for the Silicon Industry”
1245 Walking to boat from outside Rica Nidelven
1300 – 1830 Excursion with boat. Lunch will be served on board.
1930 Dinner at Rica Nidelven

Wednesday June 25

Solar Silicon I

- 0830 – 0855 A. Souto, Javier Bullon, Ramon Ordás, JM Miguez, *Ferroatlantica*, “Industrial Scale Vacuum Application in the FerroSolar Project”
0855 – 0920 Ye Wang, Wenhui Ma, and Kazuki Morita, *University of Tokyo*, “Removal of Boron from Molten Silicon by CaO – SiO₂ – CaCl₂ Slag Treatment”
0920 - 0945 Jan-Philipp Mai and Gabriele Raabe, *JPM Silicon GmbH*, “High-purity Silicon from High-purity Pellets Using Direct Carbothermic Reduction in a Microwave Furnace”
0945 - 1005 Coffee Break

Silicon Characterization

- 1005 - 1030 Eloi Kewes, F. Dahlem, S. Bec, B. Vacher, N. Estime, J. Grollemund and J.-L. Loubet, *Ecole Central de Lyon*, "Towards the Understanding of Grinding Mechanisms of Metallurgical-Grade Silicon"
- 1030 - 1055 Patrick Galler, Andrea Raab, Sabine Freitag, Kjell Blandhol, Joerg Feldmann, *Elkem AS*, "Improved Method for Analyzing Boron in Metallurgical Silicon"

Silane Chemistry

- 1055 - 1120 Larry Coleman, *Consultant*, "Best Practices for Fluidized Bed Reactors in the Hydrochlorination Process"
- 1120 – 1140 Break
- 1140 - 1205 Alba Ramos, A. Rodríguez, J. Valdehita, J.C. Zamorano, L. Méndez-Giménez, and C. del Cañizo *Universidad Politecnica de Madrid*, "Quantifying Heat Losses by Radiation, Convection and Conduction in a CVD Reactor for Polysilicon Production"
- 1205 - 1230 Werner O. Filtvedt, Trygve Mongstad, Hallgeir Klette, Arve Holt, Sverre Sørensen, Josef Filtvedt t, *IFE*, "Novel Low Cost Production through Centrifuge Chemical Vapor Deposition"
- 1230 – 1255 Larry Coleman, Paul-M. Pellney, *Consultant, Dow Chemical Company*, "Catalyzed Disproportionation of Chlorosilanes"
- 1255 - 1415 Lunch

Solar Silicon II

- 1415 - 1440 Sefa Yilmaz, Tony Thompson, Stein Julsrud, Matt Miller, *REC Silicon*, "A Semi-Quantitative Comparison of Silane and TCS Based FBRs for Producing Granular Si as Solar Si Feedstock"
- 1440 – 1505 Brian S. Holsclaw, Michael J. Molnar, William Herron, Joel P. McDonald, Matthew A. Gave, and Jonathan J. Host, *Hemlock Semiconductor Co.*, "Controlled Crystallinity of Silicon Powders"
- 1505 - 1530 Jörg Acker *, Jana Dücke, Anja Rietig, Tim Müller, Stefan Eisert, Birk Reichenbach, Wolfgang Löser, *Hochschule Lausitz*, "Segregation, Grain Boundary Milling and Chemical Leaching for the Refinement of Metallurgical Grade Silicon for Photovoltaic Application"

Poster Session (5 minutes oral presentation)

- 1530 - 1620 "Berndt Witgens, *SINTEF*, "Industrial Measurements of Diffuse Emissions"
- Maria Førde Møll, Halvard Tveit, Kjell Håkon Berget, *Elkem Silicon Materials*, "Solidification of Metallurgical Grade Silicon. Grain size and distribution of intermetallic phases"
- Felix Neumeyer, Matthias Berger, Guido Wagner, Max C. Holthausen and Norbert Auner, *Goethe University*, "From Oil Sands to Silicon Tetrachloride and Silicon through Plasma-Assisted Synthesis"
- Jan Tillmann, Lioba Meyer, Hans-Wolfram Lerner, Max C. Holthausen and Mattias Wagner, *Goethe University*, «Chloride-Induced Aufbau of Perchlorinated Cyclohexasilanes from Si₂ Cl₆
- Jan-Philipp Mai, *JPM Silicon GmbH*, "Recycling Silicon Fines by Microwave Heating"

Dimitriy Slizovskiy, Halvard Tveit, I. Brede, G. M. Tranell, G. J. Andersen, N.E.Kamfjord, B. Wittgens *Elkem Silicon Materials*, "The industrial-scale study of the effect of charge frequency and H₂O behaviour in the off-gases on NO_x emissions in Si furnace"

Steffen Mueller, *SiTec* "New Developments in Production of High Quality | Polysilicon"

Egil Krystad, *NTNU* "Kinetic Assessment for Slag Refining of Silicon Using the CaO – SiO₂ System"

1900 - 2000 Poster Session and Reception

2000 Course Dinner at Rica Nidelven

Thursday June 26

Solar Silicon III

0830 – 0855 Gabriella Tranell, Ida Kero, Mari K. Næss, Vegar Andersen, *NTNU*, "Thermodynamic and kinetic behaviour of Ca, Al and B in the refining of liquid silicon"

0855 – 0920 Samira Sokahnavran and Mansor Barati, *University of Toronto*, "Determination of Anodic and Cathodic Current Efficiencies for Silicon Electrowining on Cu-Si Alloy "

0920 – 0955 Anne-Karin Søliland, Marit Dolmen, Gunnar Halvorsen, Ragnar Tronstad, *Elkem Silicon Materials*, "Simplified Value Chain for SoG-Si Shows Promising Results at Elkem Solar"

0955 – 1020 Matthias Heuer, Alain Turenne, Martin Kaes, Terry Jester, *Calisolar GmbH*, "Metallurgically purified silicon for photovoltaics"

1020 – 1040 Coffee Break

Silicon Application

1040 – 1055 Werner Filtvedt, Hallgeir Klette, Arve Holt, *IFE*, "Production of Tailored Silicon Nano Particles"

1055 – 1120 Hiroki Sakaguchi, Hiroyuki Usui, and Masahiro Shimizu *Tottori University*, "Silicon based Anodes for Next Generation Lithium Ion Battery"

1120 – 1145 Akihiro Yamano, Masanori Morishita, Takashi Mukai, Masahiro Yanagida and Tetsuo Sakai, *Research Institute for Ubiquitous Energy Development*, "Safe and Long Life Li-ion Batteries for Vehicles and Energy Storage"

Silicon Market

1145 - 1210 Jørn de Linde, *CRU*, "Silicon - Next Five Years"

1210 - 1245 Lunch

1300 Departure