metal production

SFI Metal Production

March 2017
No. 1/17

Newsletter Q1/17

Winter 2017 is already at the end, and spring is here. The SFI Metal Production team has had an busy winter with many highlights.

TMS 2017

The TMS was a success for the SFI Metal Production with many interesting presentations. This was the first conference where the SFI team could present results that originated from the SFI. Six PhD candidates and students linked to the SFI were presenting their work with excellence and high quality. We are proud of the students and we are looking forward to upcoming events!

Read more about the TMS in the Newsletter.

SPRING MEETING 25th-26th of April 2017

The Spring Meeting 2017 will be looking again to the Norwegian Process Industries' Roadmap and the report from the Committee for Green Competitiveness. What has happened since last autumn, and what can we expect from the authorities/government in the coming years to comply with the goals set in the reports!

The Spring Meeting 2017 will focus along three thematic lines:

Thermodynamics, Particle Technology and Waste

This will provide an opportunity to focus more in depth on areas that are very important for the SFI. We hope this can give the audience i.e. industry and colleagues from the research communities, a possibility to interact with the speakers.

The PhD candidates and Post Docs will present their work in a separate session. A poster session will give more time for discussions with each candidate. We are looking forward to meet the students and listen to their scientific story.

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SPECIAL POINTS OF INTEREST

- Price for excellent poster and 2nd place in sword competition at TMS
- Aachen and Trondheim renew their collaboration
- 2 New Projects!

Light Metals 2017
PREFACE

...
The growth in aluminum production in the East, especially China, has been tremendous, and more plants are on the drawing board. Unfortunately, this has caused an oversupply with low market prices for aluminum, which may continue for several years to come unless environmental restrictions on CO2 emissions in China slow down the expansive policy. The recent growth, mostly based on coal-fired power plants, with an environmental footprint ten times that of aluminum produced from hydro- or nuclear power is challenging aluminum as a green metal.
....
Fortunately, we also see a healthy growth in aluminum replacing more heavy metals in transportation, leading to better energy efficiency. The growth in both electric and plug-in hybrid cars and trucks are promising for our industry and makes us eager to reply to new demands for products and leaner production strategies. In spite of the pressure on the aluminum price, which we have to cope with through process and technology improvements, the overall picture of the industry is good. In times with low market prices, it may be comfortable to cut back on R&D as a means to improve economical results. However, lack of continuity in long-term R&D may eventually slow down the drive for making the industry, even more cost-effective and environmentally sustainable.
....
For highly educated people recruited to the industry, not being able to participate with scientific contributions is a loss of opportunity to meet experienced people in the industry and from academia, reducing the opportunity to create networks and to get new inspiration useful in their daily work. We should all work together, share ideas, and contribute to develop new opportunities for our industryand our society.
....

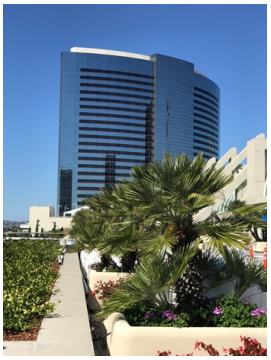
Arne P. Ratvik
Editor Light Metals 2017

TMS 146th Annual Meeting & Exhibition

The TMS 146th Annual Meeting & Exhibition was arranged in San Diego from 26th of February to the 2nd of March.

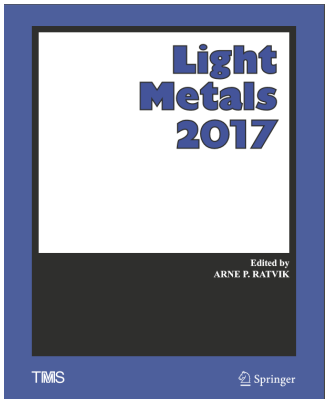
More than 50 delegates from Norwegian companies were attending the conference.

All papers presented at TMS with connection to the SFI can be found on the SFI eRoom.



Light Metals Editor

The SFI center is honoured to have one of its Research Domain leaders Arne Petter Ratvik as Light Metals editor for 2017. Light Metals is «the bible» for the Light Metals industry. The outline is from the Preface in the *Light Metals 2017, The Minerals, Metals & Materials Society 2017 (TMS), published by Springer.*



Editor Arne Petter Ratvik

TMS 2017 Honouree Symposium

This year TMS dedicated sessions in Cast Shop Technology in honor of Thorvald Abel Engh (NTNU) and Christian Simensen (SINTEF) of Norway. The reason behind was that Simensen and Engh have made a substantial contribution to the science and technology of alloying practice, melt oxidation, melt characterization and melt refining. Both have been ambassadors for Norway spending extended periods in Australia and USA . They have supervised many PhD students and collaborated extensively with industry and other researchers.

In the session that took place Tuesday February 28th in San Diego, overviews and updates of latest research were presented from industry and academia, with good attendence.

The day in honor of Norwegian metallurgy ended with a dinner among good friends and colleagues. Unfortunately, Engh was not able to attend himself. Nina Dahl gave a nice speach to Thorvald Engh where as John Grandfield filled in about Christian Simensen.

Price for Excellent Poster at TMS 2017

MSc student Trine Larssen Asklund won the price for excellent poster at the TMS 2017 in San Diego this February. The title of the poster was "Reduction of MnO and SiO2 from Comilog based Charges". Trine has been studying Kinetics and mechanisms in SiMn production, within the SFI Metal Production RD2 Primary Metal Production Research Domain. Her supervisor is Professor Merete Tangstad. Trine is now in Johannesburg in South-Africa at Mintek doing her MSc-thesis, studying the interaction between SiMn slag and clay used in the tap hole in industrial furnaces.

Rune Hagberg Stana and Vincent Yves Canaguier won 2nd place in the sword competition. The sword was made by the black smitting group at the Department of Material Science and Engineering at NTNU. David Dominikus Eide Brennhaugen and Espen Unhjem have also contributed considerable to the sword making, but could not attend the TMS 2017.

«For highly educated people recruited to the industry, not being able to participate with scientific contributions is a loss of opportunity.»

SUMMERJOBS & STUDENTS IN SFI 2017

Aluminum

Sigvart Eggen Hansen
Summer job
«Classification and characterization of recyclable materials from Al electrolysis.»
Alcoa Mosjøen + NTNU

Eirik Andre Nordbø
Summer job
«Off-gas and scaling pre-study»
Hydro + NTNU

Dagny Myrhaug
Summer job
«Purification efficiency of Al from non-metallic inclusions using ceramic filter»
Hydro Sunndalsøra + NTNU

Turid Danbolt
Summer job
«Recycling of Al from Caviar tubes and Nespresso capsules»
Hydro Holmestrand + NTNU

Trygve Storm Aarnæs
Summer job/Project/MSc-thesis
«Oxidation of AlMg alloys (By substitution)»
Alcoa Mosjøen + NTNU

Cathrine Kyong Solem
Summer job/Project/MSc-thesis
«Study of wetting between Al and various filter media»
Hydro Sunndalsøra + NTNU

Sindre Gylver Engzelius
Summer job/Project/MSc-thesis
«Alumina dissolved in cryolite melt»
Alcoa Mosjøen + NTNU

Ingrid Meling
Summer job/Project/MSc-thesis
«Fluxing of oxide films on recycled Al»
Hydro Holmestrand + NTNU

Ferro

Additional summerjobs and students will be in the ferro area.

Visit from the RWTH Aachen University

Thursday 23rd of February 2017, Professor Bernd Friedrich and Mertol Gökelma from Aachen visited the SFI Metal Production.

The department of Metallurgy and Materials Science in Aachen has 58 employed students, Phd candidates and Post.docs and 33 employed administrative and technical staff lead by B. Friedrich.

The aim of the visit was to establish a closer collaboration between Aachen and Trondheim

NTNU/SINTEF and Aachen are working in similar areas and hence, synergies between the groups can be achieved by working closer together.

«...synergies between the groups can be achieved by working closer together.»

Industry + PhD = Resource Group

Resources from the industry will participate in the PhD Candidates Recource groups.

In order to ensure a best possible enviroment for the PhD candidates with scientific input also from the industry, a resource group has been allocated to each PhD candidate.

The resource groups have been appointed by the industry partners.

All PhD candidates have now a small group of 2-4 people that will meet on a regular basis.

Aud Wærnes
Center Director

Carbon Seminar

The 27th-28th of March 2017 a seminar with focus on Carbon Materials for Metal Production took place at the PFI senter at NTNU Gløshaugen, Trondheim.

Experts within the field from the industry, PhD-candidates and students was gathered to exchange knowledge and experience in using different carbon materials in different processes. Also new and more enviromentelly friendly materials was presented. Over 50 people were attending the seminar.

In the evening at the 27th of March, all the paticipants were gathered at Tyholttårnet for pizza and discussions.

A big thanks to Professor Merete Tangstad and Professor Ann Mari Svensson for making this seminar take place. Also a special thanks to all the external contributors, which shared their knowledge and research, among these: Victor Myrvågnes (Elkem), Johan A. Andersen (Elkem), Les Edwards (Rain CII), Hogne Linga (Hydro) and Paul Beukes (North-West University).

Presenter: Benedicte Hovd, SINTEF.

Participants at the Carbon Seminar

New Projects:

BEST Aluminum Cast Slab Quality

The IPN project "BEST" is a spin-off from the SFI granted from The Norwegian Council of Research. The project owner is Hydro Aluminium. The project goal is to deliver the best metal quality from the Norwegian Aluminum foundries by deciding (BEstemme), Study (Studere), and adress Actions (Tiltak). In other words, study and implementing measures to reduce oxide- and carbide inclusions.

The main objective of the proposed project is to add value by introducing product and process innovations that reduce carbide and oxide forming inclusions, which increase the quality. Reducing the amount of metal that is oxidized and give loss of metal to dross, will give increased yield.

The project has a added value potential of more than 60 M NOK/year, incl. cost savings. The innovation have to take place in Norway. Improvements leading to reduced environmental impact through monitoring of exhaust gases from the cast house furnaces, will be introduced.

Controlled Tapping

The overall goal is to maximize metal yield, maximize operation load and minimize hazardous tapping conditions. The goals for the project is to reduce the average standard deviation of tapping amount by 10%, the numbers of severe uneven tapping, which leads to major environmental and logistic disturbance, by 50% and the metal lost to slag by 2%.

In order to achieve this we need to understand how furnace design and operation correlates with furnace tapping. This by determing the fundamental relations between furnace operation and geometry, structure of furnace interior and slag-metal behavior during tapping. Also develop a mind-set model for the tapping operation for knowledge distribution

The participating partners in this project is the Norwegian silicon and ferroalloy producers (Elkem, Eramet, Finnfjord, Fesil, Glencore and Wacker), the Norwegian University of Science and Technology, SINTEF and Mintek (South Africa). The Norwegian industry partners are in the technological forefront regarding research and development for within their processes.

The 5 RD Domains

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SFI Metal Production

Metal Production is an interdisciplinary Centre for Research-based Innovation (SFI). During the next decades, the Norwegian metal industry will need to achieve even higher-quality output with more efficient use of resources and energy.

The main goal of the Metal Production is to enable industrial innovation and give the industry long term access to world class fundamental competence and candidates. This will enable the industry to maintain its position at the forefront of sustainable innovation.

New EU Coordinator and Researcher

Maria Wallin started as a new EU coordinator and researcher at NTNU from January 2017. She is a Chemical engineer which holds a PhD in Material Science with a specialization in Applied surface chemistry. She did most of her undergraduate and graduate studies at Chalmers University of Technology in Sweden and parts at University of Minnesota in USA, Stanford University in USA and at Nanyang Technical University in Singapore.

Before starting at NTNU, she has been working as a Product developer at a small spin off company called Promimic and as a Management and quality consultant at Knightec in Sweden.

Colleagues describes her as helpfull and efficient.

We all hope you will have a interesting and good time in Trondheim.

SFI Metal Production

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metal production

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Norges forskningsråd