

15th Nordic Corrosion Congress

May 19–21 2010, Stockholm



Program

Congress & graduate course

www.nkm15.com

To solve the corrosion problems of tomorrow it is necessary that we combine the worlds of scientific knowledge, technological experience and innovative developments. A congress gives us just this opportunity of exchanging ideas and expanding our concepts of corrosion.

The topics for this congress show that handling corrosion is necessary for success in the challenges to come. The congress is based on 55 oral presentations, in parallel sessions during two days, as well as an exhibition and a graduate course in corrosion science (May 17–19 2010). The course is included in the registration fee of NKM15.

Congress Topics

The scientific and technical areas covered by NKM15 2010 in Stockholm are:

1. Monitoring and testing for research and industrial control
2. Corrosion protective strategies
3. Environmental and health aspects of corrosion
4. Aspects of design and metallurgy
5. Power generation and high temperature oxidation
6. Atmospheric corrosion
7. Fouling and microbially influenced corrosion
8. Corrosion of electronic materials

Scientific Committee

Christofer Leygraf, Chairman	Royal Institute of Technology, Sweden
Kemal Nisancioglu	Norwegian University of Science & Technology
Bård Espelid	Det Norske Veritas (DNV), Norway
Per Møller	Technical University of Denmark, Denmark
Lisbeth Hilbert	FORCE Technology, Denmark
Olof Forsén	Helsinki University of Technology, Finland
Kazimierz Darowicki	Gdansk University of Technology, Polen
Rachel Pettersson	Outokumpu Stainless, Sweden



Welcome Reception, Wednesday, May 19

17.00–19.00 Welcome Reception

Location: Clarion Hotel Stockholm, Ringvägen 98, Stockholm, Sweden
www.clarionstockholm.se

Congress Dinner & Boat Trip, Thursday, May 20



18.00–21.30 Thousand Island Cruise

This cruise is an amazing way to experience the best parts of our beautiful archipelago. The congress dinner is served during the cruise.

Graduate Course in Corrosion Science, 7.5 p

The graduate course in Corrosion Science is intended for graduate students or researchers working in academic or industrial environments with an interest in materials science and engineering.

Aims and Scope

Corrosion is a truly interdisciplinary science and the aim is to discuss the underlying chemistry and physics of the most important forms of metal corrosion. Mechanistic as well as applied aspects will be dealt with.

Lectures

The course includes 16 lecture hours on three consecutive days prior to NKM15. Most lecturers are part of KorrosionsCentrum (a collaboration between Swerea KIMAB and KTH) in Stockholm and the most competent experts in their respective fields. All lecture rooms are located on Osqualdas väg 6B, level 1, 2 or 3, at the KTH Campus area.



Date/Time	Room	Lecture	Topic
May 17			
10.15–12.00	Q31	C. Leygraf	Introduction. Repetition of basic concepts
13.15–14.00	Q15	J. Pan	Thin oxide film formation
14.15–17.00	Q15	D. Thierry	Corrosion protection by organic and inorganic coatings
May 18			
9.15–11.00	Q13	R. Pettersson	Pitting/crevice corrosion
11.15–12.00	Q13	R. Pettersson	Stress corrosion cracking and hydrogen embrittlement
13.15–15.00	Q17	J. Pan	Passivity
15.15–17.00	Q17	C. Leygraf	Atmospheric corrosion
May 19			
9.15–12.00	Q22	P. Szakalos	High temperature corrosion

Course Literature

Selected chapters in "Corrosion Mechanisms in Theory and Practice", 2nd edition, Ed. P. Marcus, Marcel Dekker, Inc., New York (2002). The course book has to be purchased in advance by each participant, price approx. 100 Euro. A limited number of the 1st edition of the book (1995) will be available at course start for 25 Euro. In addition, lecture notes will be distributed by the lecturers.

Prerequisites

The participants are assumed to be graduate students at the university or researchers working in industry with a background in physics, chemistry or materials science. The introductory lecture covers the necessary background information.

Examination

An individual project task must be completed within one of the topics of the course, and under supervision of the corresponding lecturer. The total amount of work of each task is about four weeks and should be completed by Sept 1, 2010.

Registration and Course Fee

The course is included in the registration fee of NKM15. Use the online registration form at www.nkm15.com for registration.

Thursday, May 20

08.00–09.00 Registration at Clarion Hotel Stockholm, Ringvägen 98
09.00–09.10 Opening Ceremony
Staffan Söderberg, MD, Swerea KIMAB &
Professor Christofer Leygraf, Royal Institute of Technology

— Session 1 —

Theme: Environmental and health aspects of corrosion

Chairman: Inger Odnevall Wallinder, Royal Institute of Technology, Sweden

- 10.30–10.50 **Corrosion of aircraft alloys and coatings by runway de-icing chemicals**
E. Huttunen-Saarivirta¹, V.-T. Kuokkala¹, J. Kokkonen¹ and H. Paajanen²
¹ Department of Materials Science, Tampere University of Technology, Finland, ² Finnish Air Force, Finland
- 10.50–11.10 **Stainless steel pipes – Results from field exposure in various types of soil**
L. Sjögren¹, G. Camitz¹, J. Peultier², S. Jacques², A. Bergquist³, A. Pourbaix⁴ and P. Carpentiers⁴.
¹ Swerea KIMAB, Sweden, ² ArcelorMittal - Industeel, France, ³ Outokumpu Stainless, Sweden, ⁴ Belgian Centre for Corrosion Study, Belgium
- 11.10–11.30 **Rig testing of copper in Stockholm water**
Mari Sparr and Claes Taxén, Swerea KIMAB, Sweden
- 11.30–11.50 **Failure of new brass components in high conductivity drinking water due to intergranular corrosion and stress corrosion cracking**
Frank Fontenay, Asbjørn Andersen and Søren Klinggaard, FORCE Technology, Denmark
- 11.50–12.10 **Corrosion investigations in a 30MWth oxyfuel pilot plant firing lignite – comparison of air-firing and oxyfuel mode**
Anders Hjörnhede, Martin Bjurman, Melanie Montgomerie and Pamela Henderson, Vattenfall, Sweden
- 12.10–13.30 **Lunch**
- 13.30–13.50 **Rig testing of copper release from copper pipes**
Helle Michaelsen, Technical director, Guldager, Denmark
- 13.50–14.10 **The effect of water chlorination on the corrosion resistance of stainless steel**
S. Mameng, R. Pettersson and S Randström, Outokumpu Stainless, Sweden
- 14.10–14.30 **Essential factors assessing the extent of metals released from particles of pure metals, alloys and compounds during the OECD transformation/dissolution test**
Yolanda Hedberg and Inger Odnevall Wallinder, Royal Institute of Technology, Sweden
- 14.30–14.50 **Long-term aspects of patina dissolution, patina formation and aesthetic appearance of brass used for outdoor constructions in urban environments representative of Europe**
Jon Brunk¹, Sara Goidanich² and Inger Odnevall Wallinder¹
¹ Royal Institute of Technology, Sweden, ² "Giulio Natta" (CMIC) Politecnico di Milano, Italy
- 14.50–15.20 **Coffee**
- 15.20–15.40 **Corrosion of the copper canister in the early stage of the final disposal of spent nuclear fuel**
L. Rintala, J. Aromaa and O. Forsén, Helsinki University of Technology, Finland
- 15.40–16.00 **Study of the electrochemical properties of Co-based alloy used in hip-joint implant applications**
Eleonora Bettini and Jinshan Pan, KTH Royal Institute of Technology, Sweden
- 16.00–16.20 **Corrosion resistance of nanocrystalline metals for biomedical applications produced by hydrostatic extrusion**
E. Ura-Bińczyk, H. Garbacz, M. Lewandowska and K.J. Kurzydłowski, Warsaw University of Technology, Poland
- 16.20–16.40 **Dissolution of Metals in Copper Chloride Solution**
M. Karonen, J. Aromaa and O. Forsén, Helsinki University of Technology, Finland

18.00–21.30 Congress dinner and boat trip

Thursday, May 20

09.10–10.00 The recovery of the DC-3 aircraft after 50 years at the bottom of the Baltic Sea
Christina M. Tengné, The Army Museum
10.00–10.30 Coffee

— Session 2 —

Theme: Monitoring and testing for research and industrial control

Chairman: Ingegerd Annergren, Swerea KIMAB, Sweden

- 10.30–10.50 **Theoretical and experimental investigation of ATR-FTIR spectroscopy at the metal-water and metal-polymer interface**
Dan Persson and Maria Öhman, Swerea KIMAB, Sweden
- 10.50–11.10 **Corrosion of aluminium in ethanol blended biofuels**
Anna Nalaskowski, Ingegerd Annergren and Dan Persson, Swerea KIMAB, Sweden
- 11.10–11.30 **Protection from crevice corrosion in plate heat exchangers**
Jesper Bergh, Adriana Sobczak and Karin Nilsson, Alfa Laval, Sweden
- 11.30–11.50 **Novel thickness gauge for on-line corrosion measurement in high temperature environments**
Kjeld Borggreen, SydTek, Sweden
- 11.50–12.10 **Application of the EPR-Test to 13% chromium steel and the role of sulphide inclusions**
P. Linhardt, M. Adler, S. Strobl and R. Haubner, Vienna University of Technology, Austria
- 12.10–13.30 **Lunch**
- 13.30–13.50 **Effects of oxygen and temperature on aqueous sour corrosion systems**
Yuan Song¹, Attila Palencsár¹, Gaute Svenningsen¹, Tor Hemmingsen² and Jon Kvarekvål¹
¹ Institute for Energy Technology (IFE), Norway, ² University of Stavanger, Stavanger, Norway
- 13.50–14.10 **Micro-electrochemical corrosion testing of welds and welding defects in stainless steel tubing**
Mikkel Østergaard Hansen, IPU Technology Development, Denmark and Rajan Ambat, Technical University of Denmark, Denmark
- 14.10–14.30 **The use of infrared thermography in the corrosion science area**
Martin Jönsson, Bo Rendahl, Ingegerd Annergren, Swerea KIMAB, Sweden

Theme: Corrosion protective strategies

Chairman: Olof Forsén, Helsinki University of Technology, Finland

- 14.30–14.50 **Characterisation of commercial novel surface pre treatments on aluminium, HDG steel and carbon steel, and comparative environmental studies with samples subsequently coated with an organic top coat**
Karin Lindqvist¹, Dan Persson², Maria Öhman² and Lars Österberg¹
¹ Swerea IVF, Sweden, ² Swerea KIMAB, Sweden
- 14.50–15.20 **Coffee**
- 15.20–15.40 **In-situ ATR-FTIR analysis of buried metal/polymer interfaces in the presence of a silane based surface pre treatment upon exposure to an electrolyte solution**
Maria Öhman and Dan Persson, Swerea KIMAB, Sweden
- 15.40–16.00 **Study of dopant effect of conducting polyaniline in active corrosion protection**
Shadi Jafarzadeh¹, Arindam Adhikari², Per Claesson¹ and Jinshan Pan¹
¹ Royal Institute of Technology, Sweden, ² YKI, Sweden
- 16.00–16.20 **Influence of natural and artificial weathering on aesthetic properties of organic coatings**
E. Scrinzi, S. Rossi, F. Deflorian and M. Fedel, University of Trento, Italy
- 16.20–16.40 **A comparative study of corrosion properties of amorphous and crystalline nickel silicide thin films**
P.L. Tam and L. Nyborg, Chalmers University of Technology, Sweden



Theme: Aspects of design and metallurgy

Chairman: Kemal Nisancioglu, Norwegian University of Science and Technology, Norway

- 09.00–09.20** **Study of nobility of phases in duplex stainless steels by means of ex-situ techniques**
Namurata Sathirachinda¹, Jinshan Pan¹, Rachel Pettersson² and Sten Wessman³
¹ Royal Institute of Technology, ² Outokumpu Stainless, ³ Swerea KIMAB, Sweden
- 09.20–09.40** **Corrosion properties of P/M hiped stainless steel. a comparison to conventional forged/rolled material**
Anders Eklund¹, Björn-Olof Bengtssona, Greg del Corso² and James F. Scanlon²
¹ Carpenter Powder Products, Sweden, ² Carpenter Technology Corporation, USA
- 09.40–10.00** **Localized corrosion behaviour of reinforcement steel in simulated concrete pore solution**
Fan Zhang¹, Jinshan Pan¹ and Changjian Lin²
¹ Royal Institute of Technology, Sweden, ² Xiamen University, China
- 10.00–10.30** **Coffee**
- 10.30–10.50** **Corrosion of steel in concrete – development of protective strategies based on thermodynamic considerations**
Andre Küter¹, Per Møller² and Mette R. Geiker²
¹ Cowi, Denmark ² Technical University of Denmark, Denmark
- 10.50–11.10** **The passivation behavior of sputter-deposited ternary W-Cr-(4-15)Ni alloys in 0.5 M NaCl solution**
Pom Lal Kharel and Jagadeesh Bhattarai, Tribhuvan University, Nepal
- 11.10–11.30** **Effect of trace elements gallium and lead on anodic activation of aluminium in chloride solution**
Esma Senel and Kemal Nisancioglu, Norwegian University of Science and Technology, Norway
- 11.30–11.50** **Passivation breakdown of aluminium oxide by surface segregation of bismuth**
Anawati¹, Spyros Diplas², Heidi Nordmark³ and Kemal Nisancioglu¹
¹ Norwegian University of Science and Technology, ² Sintef Material and Chemistry, Oslo, Norway
³ Sintef Material and Chemistry, Trondheim, Norway
- 11.50–12.10** **Effect of heat treatment on anodic activation of model AlSn alloy containing 30 ppm tin**
Juan Tan and Kemal Nisancioglu, Norwegian University of Science and Technology, Norway

Theme: Power generation and high temperature oxidation

Chairman: Rachel Pettersson, Outokumpu Stainless, Sweden

- 12.10–13.30** **Lunch**
- 13.30–13.50** **Variation of corrosion rates along a test superheater loop exposed at Masnedö straw fired power plant**
Melanie Montgomery¹, Ole Hede Larsen², Ole Biede³
¹ DTU Technical University of Denmark, ² DONG Energy, ³ Vattenfall Heat Nordic, Denmark
- 13.50–14.10** **Corrosion stability of the extruded alloyed nickel electrode in the high-temperature fuel cell.**
A. Gawdzik, S. Gajda, A. Sofronkov, M. Rybotycki, V.Kalinchak, Sh. Kurmashev and A. Chernenko.
Opole State University (Poland), Odessa National University (Ukraine)
- 14.10–14.30** **The use of ammonium sulphate to reduce corrosion in waste-fired heat and power boilers**
Annika Stålenheim, Anders Hjörnhede, Pamela Henderson, Vattenfall and Peter Viklund, Swerea KIMAB
- 14.30–14.50** **High temperature corrosion study of dense and porous stainless steels for Solid Oxide Fuel Cells**
Sebastian Molin, Maria Gazda and Piotr Jasiński, Gdansk University of Technology, Poland
- 14.50–15.20** **Coffee**
- 15.20–15.40** **Laboratory testing method of high temperature corrosion of ceramic refractories in environments containing alkali salts**
Na Li, Leena Hupa, and Mikko Hupa, Åbo Akademi University, Finland
- 15.40–16.00** **High temperature corrosion investigation in an oxyfuel burner rig**
M. Montgomery¹, M. Bjurman², A. Hjörnhede³, A. Findeisen⁴, H. J. Krautz⁴ and H-B.Rombrecht⁴
¹ Vattenfall Heat Nordic/DTU Mekanik, ² Vattenfall Research and Development, Sweden,
³ Vattenfall Power Consultant, Sweden, ⁴ Brandenburgische Technische Universitaet, Germany

16.00–16.10 Conclusion and summary of NKM15

Theme: Atmospheric corrosion

Chairman: Christofer Leygraf, Royal Institute of Technology, Sweden

- 09.00–09.20** **Failure Characterization of Overhead Power Lines Exposed to Marine Atmosphere**
J. H. Foggi¹, S. Refsnæs², N.Espallargas¹, and K. Nisancioglu¹
¹ Norwegian University of Science and Technology (NTNU), ² Sintef Energy Research, Norway
- 09.20–09.40** **Comparison of different abrasion mechanisms on aesthetic properties of organic coatings**
S. Rossi, E. Scrinzi and F. Deflorian, University of Trento, Italy
- 09.40–10.00** **Surface characterization of brass during atmospheric corrosion induced by acetic acid**
P. Qiu and C. Leygraf, Royal Institute of Technology (KTH), Sweden
- 10.00–10.30** **Coffee**
- 10.30–10.50** **Study of a chrome-free surface treatment : means of action and influence on corrosion resistance and adhesion of a thick polymer-coated galvanized steel**
Sandra Le Manchet¹, Marjolaine Doux², Gérard Moulin¹, Caroline Richard¹ and Didier Verchere²
¹ Université de Technologie de Compiègne, ² ArcelorMittal Montataire Research, France
- 10.50–11.10** **Corrosion aspects in public swimming pools**
Anders Black, FORCE Technology, Denmark
- 11.10–11.30** **Results from investigations of corrosion damages in Swedish swimming pool buildings**
Ulf Sender, Swerea KIMAB, Sweden
- 11.30–11.50** **Atmospheric Corrosion of Confined Surfaces of Zinc and Zinc Coated Steel During Wet-Dry Exposures**
D. Persson¹, C. Taxén¹, A. Mikhailov² and D. Thierry³
¹ Swerea KIMAB, Sweden, ² Institute of Physical Chemistry, Russian Academy of Sciences, Russia
³ Institut de la Corrosion, France
- 11.50–12.10** **Future revision of classification of atmospheric corrosivity according to ISO 9223-9226**
D. Knotkova¹, S. Dean², I. Yuichi³ and J. Tidblad⁴
SVUOM, Czech Republic, ² Dean Corrosion Technology, USA, ³ Yokohama National University, Japan,
⁴ Swerea KIMAB, Sweden

Theme: Corrosion of electronic materials

Chairman: Per Møller, Technical University of Denmark, Denmark

- 12.10–13.30** **Lunch**
- 13.30–13.50** **Use of conformal coatings for corrosion protection of electronic devices**
U. Rathinavelu, D. Minzari, M. S. Jellesen, P. Møller and R. Ambat, Technical University of Denmark
- 13.50–14.10** **Flux residue induced failure of an electronic add-on device**
M. S. Jellesen, D. Minzari, U. Rathinavelu, P. Møller and R. Ambat, Technical University of Denmark
- 14.10–14.30** **Corrosion in Electronics - Perspectives**
Rajan Ambat, Technical University of Denmark

Theme: Fouling and microbially influenced corrosion

Chairman: Dominique Thierry, Institut de la Corrosion, France

- 14.30–14.50** **A new approach in understanding microbially influenced corrosion (MIC) based on electrochemistry and microcopy in a ship tank model system**
A. Heyer¹, F. D'Souza², G. Ferrari², J.M.C. Mol³ and J.H.W. de Wit³
¹ M2i Materials Innovation Institute, ² TNO Science and Industry, ³ Delft University of Technology, The Netherlands
- 14.50–15.20** **Coffee**
- 15.20–15.40** **A new biofilm monitoring electrochemical sensor – Development and testing**
G. Pavanello¹, M. Faimali¹, M. Pittore², A. Mollica³, A. Mollica³, A. Mollica¹
¹ Istituto di Scienze Marine – Consiglio Nazionale delle Ricerche (ISMAR-CNR), ² e-magine IT Srl,
³ NewLab Snc, Italy
- 15.40–16.00** **Corrosion of oilfield production facilities**
Henrik Bang, Lisbeth Rischel Hilbert, Troels Mathiesen, FORCE Technology, Denmark

16.00–16.10 Conclusion and summary of NKM15

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May 19–21 2010, Stockholm

Registration and fee

The registration fee is 6.500 SEK. PhD students are invited to attend at a reduced price of 2.000 SEK.

Latest registration acceptance to those prices is March 12, 2010. After that, the registration fee will be 7.500 SEK, and for PhD students 3.000 SEK.

The registration fee includes congress participation, graduate course in corrosion science, welcome reception, congress proceedings, lunches, refreshments and congress dinner.

Please use the online registration form at:
www.nkm15.com

Exhibition & Sponsoring

The exhibition part of the conference offers a forum for companies in the field of corrosion. They are invited to display the full spectrum of instruments, equipment and services to the expert public. The cost is 13.000 SEK. It entitles one person to participate in the conference.

Further, we offer sponsorship initiatives designed to strengthen your company's image. Please contact Brita Bäckström, brita.backstrom@swerea.se, +46 8 674 17 02.

Accommodation

Reduced rates can be obtained at selected hotels. Please note that booking of hotels should be made as early as possible, since May is a very busy month in Stockholm. We have pre-booked a number of rooms in nearby hotels.

For further information: www.nkm15.com

Language

The congress language is English.

Main sponsors



Arranged by



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