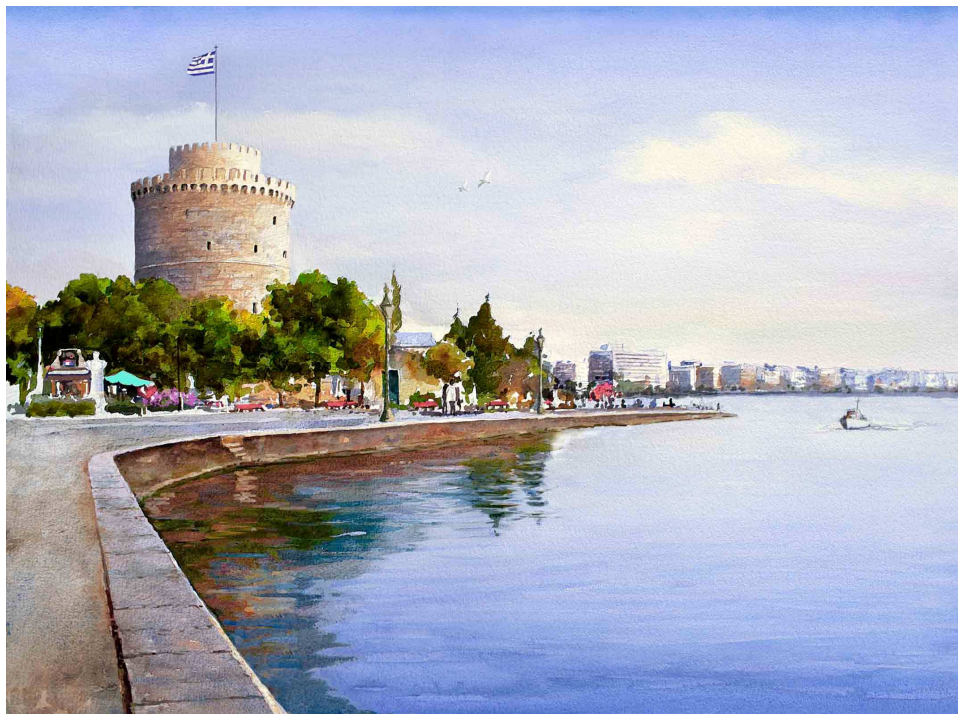


# 2<sup>nd</sup> INTERNATIONAL WORKSHOP ON DEGRADATION ISSUES OF FUEL CELLS SECOND ANNOUNCEMENT and REGISTRATION



**Date: 21-23 SEPTEMBER, 2011**

**Location: Thessaloniki, Greece**

## SCOPE OF THE WORKSHOP

This international workshop aims at:

- Understanding fundamental degradation mechanisms, as well as identifying measures to increase fuel cell lifetime, robustness and reliability.
- Identifying test procedures, characterization tools & test criteria to address degradation from the MEA to the system level
- Providing a model based approach to describe degradation phenomena
- Identifying future R&D activities for further understanding, mitigating and reducing degradation phenomena
- Identifying methodologies for evaluation of degradation and harmonisation of test procedures.

The workshop will be comprised of plenary and parallel sessions with oral presentations, which will include state of the art reviews on degradation issues on PEFC and SOFC. Oral presentations at the workshop are by invitation only from the committee. A selection of international experts will chair and guide the sessions. Additionally, a poster exhibition will be organised offering the opportunity to the participants, to present their research work on degradation issues. A panel discussion session will close the workshop, and will suggest future directions in fuel cell degradation research.

### WHO SHOULD ATTEND

The workshop is targeted at Developers, Researchers and Business Managers.

### VENUE

The workshop will be held at the Capsis Hotel [www.capsishotels.gr](http://www.capsishotels.gr) in Thessaloniki, Greece. You could find more information concerning hotel registration under <http://fctesqa.jrc.ec.europa.eu> under the section "events".

## WORKSHOP PROCEEDINGS

Selected oral and poster presentations will be published as a special issue of a peer-reviewed international journal.

### DEADLINES

**ABSTRACTS** for POSTER PRESENTATIONS must be submitted via e-mail by **31<sup>st</sup> July 2011** to:

For PEFC to: [ludwig.joerissen@zsw-bw.de](mailto:ludwig.joerissen@zsw-bw.de)

For SOFC to: [r.steinberger@fz-juelich.de](mailto:r.steinberger@fz-juelich.de)

Always copy to: [georgios.tsotridis@jrc.nl](mailto:georgios.tsotridis@jrc.nl)

### PARTICIPATION TO THE WORKSHOP

Interested persons should complete and submit the attached registration form and send it by e-mail to: [ch.hake@fz-juelich.de](mailto:ch.hake@fz-juelich.de) or fax to +49 2461 614155.

### ORGANISING COMMITTEE

Georgios Tsotridis,  
European Commission, DG JRC-IE  
Andreas Friedrich  
DLR, Germany  
Robert Steinberger-Wilckens  
Forschungszentrum Jülich, Germany

Dimitrios Papageorgopoulos  
DOE, USA  
Angelo Moreno  
ENEA, Italy  
Ludwig Jörissen  
ZSW, Germany  
Laurent Antoni  
CEA, France  
Sylvie Escribano  
CEA, France



**AGENDA**  
**WEDNESDAY 21 SEPTEMBER 2011**

<b>PLENARY SESSION</b>		
<b>CURRENT FC DURABILITY R&amp;D ACTIVITIES IN THE WORLD</b>		
<b>SESSION CHAIR: Georgios Tsotridis, DG JRC-IE</b>		
09:00	Welcoming address, Opening Remarks	Georgios Tsotridis DG JRC-IE
09:10	Overview of FCH JU operations	Angelo Moreno ENEA
09:30	Overview of DOE activities	Dimitrios Papageorgopoulos DOE
09:50	Fuel Cell activities in Canada	Silvia Wessel Ballard
10:10	Fuel Cell Activities in China	Zhi Gang Shao DICP
10:30	Fuel Cell activities in Japan	Noboru Hashimoto Panasonic Electric Works
10:50	<b>Coffee break</b>	
<b>SESSION CHAIR: Ludwig Joerissen, ZSW</b>		
11:10	Overview; PEFC Degradation	Frank A de Bruijn Nedstack
11:40	Overview; SOFC Degradation	Harumi Yokokawa AIST
12:10	Overview; MCFC Degradation	Michel Cassir Chimie ParisTech
12:30	<b>Lunch</b>	



## AGENDA WEDNESDAY 21 SEPTEMBER 2011

PARALLEL SESSION 1		
PEFC		
FUNDAMENTAL MECHANISMS LIMITING PEFC DURABILITY		
SESSION CHAIR: Frank A de Bruijn, Nedstack		
14:00	Overview of the EU FP7 DECODE project	Andreas Friedrich DLR
14:30	Electrode Degradation Mechanisms in PEM Fuel Cells	Rodney L. Borup Los Alamos National Lab
15:00	Degradation of Fuel Cell Components on the Nanoscale	Renate Hiesgen Univ. Esslingen
15:30	Proton Exchange Membrane Fuel Cell Degradation at sub-zero Temperature	Hongmei Yu DICT
16:00	Coffee break	
EX-SITU AND IN-SITU CHARACTERISATION OF MEA COMPONENTS FOR QUANTIFYING DEGRADATION MECHANISMS		
SESSION CHAIR: Rodney L. Borup Los Alamos National Lab		
16:30	Local degradation of the gas separation in PFSA membranes	Stefan Kreitmeier PSI
17:00	Diagnostics of PEM fuel cells	Norber Wagner DLR
17:30	Stability of Pt/C PEM fuel cell cathode catalyst under potential cycling conditions - An ex-situ AST characterization	Luis Colmenares SINTEF
18:00	New technique to study electrochemical potential transients during start-up/shutdown and fuel starvation	Anthony R J Kucernak Imperial College
18:30	End day 1	



**AGENDA**  
**WEDNESDAY 21 SEPTEMBER 2011**

<b>PARALLEL SESSION 2</b>		
<b>SOFC</b>		
<b>FUNDAMENTAL MECHANISMS LIMITING SOFC DURABILITY</b>		
<b>SESSION CHAIR:</b>		
14:00	Overview of Worldwide Research on Degradation Issues in SOFC	Jari Kiviahio VTT
14:30	Mechanisms of anode degradation	Christos Argirusis Univ. Clausthal/NTUA
15:00	Mechanisms of cathode degradation	Xiao-Dong Zhou Univ. South Carolina
15:30	Mechanisms of electrolyte degradation	Wolfgang Preis Univ. Leoben
16:00	<b>Coffee break</b>	
<b>THERMO-MECHANICS</b>		
<b>SESSION CHAIR:</b>		
16:30	Thermo-mechanical degradation of stacks and cells	Arata Nakajo EPFL
<b>SOEC DEGRADATION</b>		
<b>SESSION CHAIR:</b>		
17:00	Degradation issues on high temperature steam electrolyzers	Julie Mougín CEA
17:30	Experimental results on degradation during SOE operation	(t.b.c) EIFER
18:00	Development of solutions to increase durability in the field of high temperature steam electrolysis	Florence Lefebvre-Joud CEA
18:30	<b>End day 1</b>	



**AGENDA**  
**THURSDAY 22 SEPTEMBER 2011**

<b>PARALLEL SESSION 1</b>		
<b>PEFC</b>		
<b>INFLUENCE OF CONTAMINANTS</b>		
<b>SESSION CHAIR: Laurent Antoni, CEA</b>		
08:30	Effect fuel cell performance	Rodney L. Borup Los Alamos National Lab
09:00	The influence of traffic-related NO-Peaks and NO2 concentrations on PEFC	Ulrich Misz ZBT
09:30	Influence of Air contaminants on PEFC-Performance	Christian Sadeler Fraunhofer - ISE
10:00	Root cause analysis of metallic bipolar plate PEFC stack degradation	Joachim Scherer Dana
10:30	Coffee break	
<b>COMPONENT &amp; STACK DURABILITY</b>		
<b>SESSION CHAIR: Dimitrios Papageorgopoulos, DOE</b>		
11:00	Catalyst Degradation during Transient Conditions	Radoslav Atanasoski 3M
11:30	DMFC durability	Laila Grahl-Madsen IRD
12:00	MEA degradation issues	Will B Johnson Gore
12:30	Lunch	
<b>COMPONENT &amp; STACK DURABILITY</b>		
<b>SESSION CHAIR: Andreas Friedrich, DLR</b>		
14:00	Degradation Mechanisms in Transportation PEM Fuel Cells	Sathya Motopaly UTC Power
14:30	Heterogeneities of performances and degradation of PEMFC MEA	Laetitia Dubau LEPMI
15:00	Stack field test durability	Silvia Wessel Ballard



15:30	Long term operation of PEFC-stacks for stationary applications	Joachim Scholta ZSW
16:00	Coffee break	
<b>MODELLING APPROACHES FOR DEGRADATION</b>		
<b>SESSION CHAIR: Sathya Motopaly UTC Power</b>		
16:30	Understanding PEM Degradation and its Impacts on Cell Performance	Adam Weber Lawrence Berkeley National Lab
17:00	Dissolution of Platinum from Electrocatalysts for Oxygen Reduction Reaction in PEFC	Rajesh Ahluwalia Argonne National Lab
17:30	Multi-Scale Fuel Cell Modelling within the EU Project DECODE	Florian Wilhelm ZSW
18.00	Degradation modelling activities	Romain Coulon CEA/DLR
18:30	<b>End day 2</b>	





## AGENDA THURSDAY 22 SEPTEMBER 2011

<b>PARALLEL SESSION 2</b>		
<b>SOFC</b>		
<b>IMPACT ON ANODE AND CATHODE MATERIALS</b>		
08:30	Sulphur Poisoning and Internal Reforming	Stelios Neophytides Univ. Patras/ ICEHT-FORTH
09:00	Impurity Poisoning of SOFCs	Kazunari Sasaki Univ. Kyushu
09:30	Sulphur Poisoning	Sena Kavurucu Schubert FhG IKTS
10:00	Redox damage to SOFC anodes	Mikko Pihlatie VTT
10:30	Coffee break	
11:00	Thermodynamic stability and kinetic activity of SOFC materials	Xiao-Dong Zhou Univ. South Carolina
11:30	Chromium poisoning	Andreas Schuler EPFL
12:00	Chromium impact on Strontium and Manganese-free cathode materials	Maciej Stodolny ECN
12:30	Lunch	
14.00	Degradation of oxygen exchange properties of SOFC cathodes induced by volatile contaminants (Cr, Si, Na)	Edith Bucher Univ. Leoben
14.30	Impurities in Air	Teruhisa Horita AIST
15:00	Air electrode -Electrolyte Interactions - Microstructural Evolution	Prabhakar Singh U Connecticut
<b>MODELLING APPROACHES FOR DEGRADATION</b>		
<b>SESSION CHAIR:</b>		
15:00	t.b.c.	Lorenz Holzer EMPA



15:30	t.b.c.	Arata Nakajo EPFL
16:00	Coffee break	
<b>IDENTIFYING AND QUANTIFYING DEGRADATION MECHANISMS</b>		
<b>SESSION CHAIR:</b>		
16:30	Strategies in endurance testing of SOFC	Johan Hjelm Risoe-DTU
17:00	Electrochemical characterisation techniques and models for the identification of concurrent degradation processes	André Weber KIT-IWE
17:30	Tomography as a Tool of Analysing SOFC Electrode Degradation	Farid Tariq Imperial College
18:00	<b>End day 2</b>	



## AGENDA FRIDAY 23 SEPTEMBER 2011

PARALLEL SESSION 1		
PEFC		
SYSTEM DURABILITY		
SESSION CHAIR: Silvia Wessel, Ballard		
08:30	t.b.c.	t.b.c.
09:00	Recent progress of Panasonic FC system durability and performance	Yukimune Kani Panasonic R&D Center Germany GmbH
09:30	Long-term Endurance Investigations: Applied to Single HT-PEM MEAs as well as complete Fuel Cell based CHP Systems	Peter Wagner NEXT-Energy
10:00	Membrane Related Differences in the Performance Degradation of Alkaline Anion Exchange Membrane Direct Alcohol Fuel Cells	Carsten Cremers FhG-ICT
10:30	Coffee break	
DURABILITY TESTING PROCEDURES		
SESSION CHAIR: T.B.D.		
11:00	Accelerated Stress Tests	Rangachary Mukund Los Alamos National Lab
11:30	Experiences from AST in PEMFC	Anders Odegard SINTEF
12:00	t.b.c.	t.b.c.
12:30	Lunch	



**AGENDA**  
**FRIDAY 23 SEPTEMBER 2011**

<b>PARALLEL SESSION 2</b>		
<b>SOFC</b>		
<b>DURABILITY OF DIFFERENT STACK CONCEPTS</b>		
<b>8:30</b>	Durability improvement of flattened tubular SOFC stacks	Y. Matsuzaki, Tokyo Gas
<b>9:00</b>	SOFC Stack Lifetime and Reliability Improvements at Versa Power Systems	Brian Borglum VERSA Power
<b>9:30</b>	Endurance Testing of SOFC SRU	Arata Nakajo EPFL
<b>10:00</b>	t.b.c.	t.b.c.
<b>10:30</b>	<b>Coffee break</b>	
<b>ACCELERATED TESTING</b>		
<b>11:00</b>	A Draft of Accelerated Testing Protocols	Risoe-DTU
<b>SUMMARIES</b>		
<b>11:30</b>	Session chair summaries and round-table discussion	
<b>12:30</b>	<b>Lunch</b>	

**AGENDA**  
**FRIDAY 23 SEPTEMBER 2011**

<b>PARALLEL SESSION 2</b> <b>MCFC</b>		
<b>SINGLE-SESSION workshop on MCFC</b>		
<b>SESSION CHAIR:</b>		
8:30	Direct Fuel Cell Products: Research to Reality	Mohammad Farooque FCE
9:00	Quality control of components for MCFC	S.T. Kuk RIST
9:30	Advanced surface characterization of Ni-based anodes poisoned with low concentration of H <sub>2</sub> S in MCFC	Hary Devianto ENEA
10:00	MC/SO composite electrolyte fuel cells for intermediate temperature operation	Carina Lagergren KTH
10:30	<b>Coffee break</b>	
11:00	In-situ diagnostic methods for degradation monitoring by neutron diffraction	Stephen J McPhail ENEA
12:30	<b>Lunch</b>	

**AGENDA**  
**FRIDAY 23 SEPTEMBER 2011**

<b>PLENARY SESSION GENERAL DISCUSSION</b>		
<b>14:00</b>	Research Priorities for Improving Durability for PEFC and SOFC	<b>Facilitators</b>
	Common Approaches on Durability/Accelerated Testing across all FC types	<b>Facilitators</b>
	Suggestions for future international research activities on: <ul style="list-style-type: none"> <li>• Fundamental issues,</li> <li>• Durability Research,</li> <li>• Harmonized Durability Testing</li> </ul>	
<b>16:00</b>	<b>End of Workshop</b>	

## 2nd International Workshop on Degradation Issues in Fuel Cells

Capsis Hotel, Thessaloniki, Greece

21-23.9.2011

**Deadline for registration: 31st July 2011**

Title	
Family Name	
First name	
University/Institution/Company Name	
Street / P.O. Box	
Postal Code	
Town/City	
Country	
Phone	
Fax	
E-mail	
Please note any special dietary requirements, disabilities etc.	

The participation fee of 450,00 € will be paid by:

**bank transfer to**

Sparkasse Düren

Account No. 337 709

National bank code: 395 501 10

IBAN: DE14 3955 0110 0000 3377 09

BIC/Swift: SDUEDE33XXX

Reference: Workshop Degradation and participant's name

**credit card**

Fill in the form below and fax it to **+49 2461 614155**

**Deadline for receipt of payment: 31<sup>st</sup> July 2011**