Wednesday July 8, 2015

8:30 – 9:00  Registration

9:00 – 9:15  WELCOME  
Dr. M. Marrony, Dr. J. Dailly, EIFER, Germany
Prof. F. Mauvy, Prof. M. Maglione, CNRS-ICMCB, France
Dr. S. Ricote, Colorado School Mines, US

SPECIAL SESSION  FUNDAMENTAL OF PCC
Chairman: Dr. M. Marrony

9:15 – 10:00  KN1 “Materials challenges toward Protonic Ceramics Cells” 
Prof. O. Joubert (CNRS-IMN, France)

10:00 – 10:45  KN2 “Strategies for the development of highly conductive and stable solid oxide proton electrolytes”
Prof. P. Tsiakaras, Dr. D. Medvedev (Uni. Thessaly, UK)

10:45 – 11:00  Coffee – Break

11:00 – 11:30  KN3 “Integrated steamer for high temperature water electrolysis test mode”
Dr. R. Ihringer (Fiaxell, Switzerland)

11:30 – 12:15  KN4 “Proton-conducting ceramic fuel cells: fundamental aspects of carrier transport in electrolyte and cathode materials”
Dr. R. Merkle (MPI, Germany)

12:15 – 13:00  KN5 “Unusually high proton conductivity in highly defected perovskite-type oxide thin films: Ba1−yZr1−xYxO3−δ”
Dr. Y. Zenitani (Panasonic, Japan)

13:00 – 14:00  Lunch

SESSION 1  PROTON CONDUCTING CERAMIC-BASED MATERIALS: PERFORMANCES AND INNOVATION

Grain boundary resistance studies, electrolyte doping strategies and novel structure
Chairman: Dr. S. Ricote

14:00 - 14:45  KN6 “Novel Li-based proton conductors”
Prof. S.W. Tao (Uni. Strathclyde, UK)

14:45 - 15:15  O01 “Prospective research of new electrolyte materials for PCFC”
J-M Doux (IMN, F)

15:15 – 15.45  O02 “Effect of transition metal doping on the electrical properties of alkali earth cerates and zirconates”
Y-S. Lee (Uni. Kyushu, JP)
15:45 – 16:15  O03 “Unusual structural features of (La/Ba)$_2$MO$_4$ (M=Al, Ga, Si, Ge, Transition metal) Proton Conductors with the $\beta$-K$_2$SO$_4$ structure”  
P. Slater (Uni. Birmingham, UK)  

16:15 – 16:30  Coffee break  

Chairman: Prof. J. Rozière  

16:30 – 17:00  O04 “Composite protonic conductors based on BaCeO$_3$ with improved chemical stability and ionic conductivity”  
P. Pasierb (AGH, PL)  

17:00 – 17:30  O05 “Effect of Boron additions on the sintering and conductivities of P,Si doped Ba$_2$M$_2$O$_5$ (M=In, Sc)”  
P. Keenan, (Uni. Birmingham, UK)  

17:30 – 18:00  O06 “Effect of sintering temperature on the transport properties of ZnO-modified SZY for PCECs”  
Domingo Pérez-Coll (CSIC, SP)  

18:00 – 18:30  O07 “Anionic doping F $\rightarrow$ O$^{2-}$ of perovskite-related systems as the method of improving ionic conductivity and chemical stability”  
N. Tarasova (Uni. Ural Federal, Russia)  

18:30 – 20:00  POSTER SESSION AND APPETIZER  

Thursday July 9th, 2015  

SESSION 1 (SUITE)  PROTON CONDUCTING CERAMIC- BASED MATERIALS: PERFORMANCES AND INNOVATION  

Bulk proton transport mechanism and electrolyte properties  
Chairman: Prof. F. Mauvy  

8:30 – 9:00  O08 “Characterization of proton conduction in mixed and pure ionic conductors”  
P-M. Geoffroy (SPTS Uni. Limoges, F)  

9:00 – 9:30  O09 “The influence of quantum effects on the protonic conduction in BaZrO$_3$”  
F. Briec (Uni. Paris-Saclay, F)  

9:30 – 10:00  O10 “On the nature of electronic defects in yttrium doped barium zirconate in oxidizing atmosphere”  
S. Ricote (Colorado School of Mines, US)  

10:00- 10:30  O11 “Mechanical properties of fully dense BaZr$_{1-x}$Y$_x$O$_{3-x/2}$ electrolyte materials for PCFCs”  
G. Dezanneau (SPMS, F)  

10:30 – 10:45  Coffee break
SESSION 2

**Proton Conducting Ceramic - based system: Manufacturing strategies, Scaling-up and Innovation**

*Chairman: Prof. M. Stoukides*

10:45 – 11:30

**KN7 “Protonic Ceramic cell: Nano-structuration and tailoring processing”**

Prof. E. Traversa. (KAUST, SA): *Invited speaker*

Novel electrodes architecture

11:30 – 12:00

**O12 “Anodes for proton ceramic fuel cells”**

D.P. Fagg (Uni. Aveiro, PO)

12:00 – 12:30

**O13 “Development of oxygen electrodes with integrated current collector for Proton Ceramic Electrolyzer cells”**

E. Vollestad (Uni. Oslo, NO)

12:30 – 13:00

**O14 “Development of composite steam electrodes for BCZY based high temperature protonic conducting electrolyzers”**

N. Bausa (CSIC, SP)

13:00 – 14:00

Lunch

Cell architecture and modeling

*Chairman: Dr. J. Dailly*

14:00 – 14:30

**O15 “Development of metal supported protonic electrolyzer cells (MSD-PCEC)”**

M. Stange (SINTEF, NO)

14:30 – 15:00

**O16 “Modelling and prediction of the deformation during co-sintering of a BCY15_based dual membrane SOFC”**

A. Chesnaud (Mines-ParisTech, F)

15:00 – 15:30

**O17 “The evaluation of open-circuit potential in fuel cells and electrolyzers with mixed-conducting electrolyte membranes”**

R.J. Kee (Colorado School of Mines, US)

15:30 – 15:45

Coffee break

SESSION 3:

**Proton Conducting Ceramic- based system: Applications and Reliability: Where we are!**

*Chairman: Prof. E. Traversa*

15:45 - 16:30

**KN8 “Nanostructured Membrane reactors for methane conversion and hydrogen production”**

Prof S. Liu (Uni. Curtin, AUS): *invited speaker*

Fuel Cell

16:30 – 17:00

**O18 “Solid Oxide Fuel Cells based on Lanthanum Tungstate electrolytes”**

J.M. Porras-Vasquez (Uni. Malaga, SP)
17:00 – 17:30  O19 “Electrochemical tests of a dual membrane SOFC in a dedicated 3-chamber set-up”

D. Masson (Mines-ParisTech, F)

17:30 – 18:00  O20 “Elaboration and electrochemical characterizations of up-scaled protonic Ceramic Cells”

J. Dailly (EIFER, D)

20:00  GALA DINNER  (Hôtel Mercure Bordeaux cité mondiale)

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Friday July 10th, 2015

SESSION 3 (suite): PROTON CONDUCTING CERAMIC- BASED SYSTEM: APPLICATIONS AND RELIABILITY: WHERE WE ARE!

Hydrogen pumping /Ammonia synthesis
Chairman: Prof. H. Matsumoto

9:00 – 9:30  O21 “H₂- separation of dual-phase BaCe₁₋ₓEuₓO₃₋₄ :Ce₁₋ₓYₓO₂₋₄ (x=0-0.2; y=0-0.2) ceramic membranes”

M. Balaguer (FZ Jülich, D)

9:30 - 10:00  O22 “Dense composite-ceramic and ceramic_metallic membranes for hydrogen separation”

W.A. Rosensteel (Colorado School of Mines,US)

10:00 – 10:30  O23 “Hydrogen flux measurements by stoichiometric titration in galvanically driven Cu/BaCe₀.₂Zr₀.₇Y₀.₁O₂₋₄/60Ni-BCZY27 closed-end tubular cells”

A. Manerbino (CoorsTek, US)

10:30 – 10:45  Coffee Break

Chairman: Dr. G. Coors

10:45 – 11:15  O24 “High hydrogen permeability and CO₂-resistance of cer-cer composite membranes based on BaCe₀.₆₅Zr₀.₂Y₀.₁₅O₃₋₄ and Y_ or Gd-doped CeO₂”

E. Rebollo (CNR-IENI, I)

11:15 – 11:45  O25 “Solid state ammonia synthesis using a BaCe₀.₂Zr₀.₇Y₀.₁O₂₋₄ solid electrolyte and a Ni-BCZY electrode”

M. Stoukides (CERTH Uni. Thessaloniki, GR)

Hydrogen production

11:45 – 12:15  O26 “The effect of mixed-conductivity on electrolysis cells involving BaCeₓZr₀.₉₋ₓY₀.₁O₃₋₄ (x=0, 0.1, 0.2) protonic-ceramic membranes”

N.P. Sullivan (Colorado School of Mines, US)
12:15 – 12:45  
O27 “Application of BaCe$_{0.85}$Y$_{0.15}$O$_{2.925}$ for the development of Fuel Cell operated in reversed Mode”  
D. Vladikova (IEES, BG)

12:45 - 14:00  
Lunch

14:00 – 16:00  
Highlights and discussion  
Round-table:  
Round-table Chairmen& Scientist Committee: main results and R&D orientations  
Organizer Committee: Next steps & conclusion
POSTERS SESSION

Chairman: Prof. G. Taillades

P1: Layered Microstructures based on BaZr_{0.85}Y_{0.15}O_{3-δ} for Proton Ceramic Electrolyzer cells by Pulsed Laser deposition
E. Stefan (Uni. Oslo, NO)

P2: Insights on thermal and transport features of BaCe_{0.8-x}Zr_{x}Y_{0.2}O_{3-δ} proton-conducting materials for electrochemical devices
P. Tskiaras (Uni. Thessaly, GR)

P3: Compensating total conductivity with stability: the transition from cerates to zirconates
P. Tskiaras (Uni. Thessaly, GR)

P4: Assorted cathode materials for BaCe_{0.8-x}Zr_{x}Y_{0.2}O_{3-δ} electrolytes: analysis of thermal properties
P. Tskiaras (Uni. Thessaly, GR)

P5: Phase transition and modified transport numbers in BCZY27
G. Mather (CSIC, SP)

P6: Sol-gel synthesis of SrZr_{0.9}Y_{0.1}O_{3-δ} thin films for protonic ceramic electrolyser membranes
G. Mather (CSIC, SP)

P7: Thermodynamics and stoichiometry relaxation kinetics in materials with three carriers: analytic relations and numerical simulations
R. Merkle (MPI, D)

P8: Development of electrodes for methane dehydroaromatization on protonic_ceramic membranes
S. Ricote (Colorado School of Mines, US)

P9: Hydrogen permeation through CO_{2}-stable dual phase ceramic membranes based on La_{5.5}WO_{11.25}-3La_{0.87}Sr_{0.13}CrO_{3}
N. Bausa (CSIC, SP)

P10: Novel electrical conduction observed in yttrium-based strontium zirconate in dry hydrogen
T. Fujisaki (Uni. Kyushu, JP)

P11: The effect of synthesis path on electrical properties and chemical stability of BaCe_{0.9}Y_{0.1}O_{3-δ}-BaWO_{4}
A. Lacz (AGH, PO)

P12: Proton-ceramic fuel cell (PCFC) system modelling and analysis: examining techno-economic characteristics of 10 kWe PCFC combined heat and power systems
A. Dubois (Colorado School of Mines, US)

P13: A high-performance proton conducting solid oxide fuel cell elaborated by wet chemical routes
G. Taillades (ICG AIME, FR)

P14: Elaboration of planar and tube SOFC-H⁺ by tape rolling method
P. Tskiakaras (Uni. Thessaly, GR)

P15: F⁻-doped solid solutions based on Ba₅Ca₂Nb₂O₁₁ (synthesis, structure, electrical properties)
N. Tarasova (Institute of Natural Science, Ural Federal, Russian Federation)

P16: Challenges and available solutions for H⁺-SOFC cathode materials
F. Mauvy (ICMCB-CNRS, Bordeaux, France)