

nanoGe Fall Meeting 2018 (FallMeeting18)

S2 Light Driven Water Splitting

Torremolinos, Spain, 2018 October 24th - 26th

Conference Chairs: Wolfram Jaegermann and Bernhard Kaiser

Conference Program

October 24th - Day 3 (Wednesday)

WatSpl S2.1

- 14:30 - 15:00
S2.1-I1 Martin Rohloff, Björn Anke, Spark Zhang, Christina Scheu, Martin Lerch, Anna Fischer (*University Freiburg, IAAC, Germany*)
Improving BiVO₄ thin Film Photoanodes for Light-Induced Water Oxidation
- 15:00 - 15:15
S2.1-O1 Luis I. Granone (*Institute of Technical Chemistry, Gottfried Wilhelm Leibniz University Hannover, Callinstrasse 3, D-30167 Hannover, Germany*), Ralf Dillert, Detlef W. Bahnemann
Effect of the Degree of Inversion on the Photocatalytic Activity of Spinel ZnFe₂O₄
- 15:15 - 15:30
S2.1-O2 Hamidreza Hajiyani (*Department of Physics, Theoretical Physics and Center of Nanointegration (CENIDE), Universität Duisburg-Essen, Lotharstraße 1, 47057 Duisburg, Germany*), Alexander G. Hufnagel, Siyuan Zhang, Thomas Bein, Dina Fattakhova-Rohlfing, Christina Scheu, Rossitza Pentcheva
Origin of Enhanced Efficiency of Tin-doped Ultrathin Hematite Photoanodes for Water-Splitting
- 15:30 - 15:45
S2.1-O3 Sönke Müller (*Institute for Solar Fuels, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner-Platz 1, 14109 Berlin, Germany*), James Hirst, Hannes Hempel, Daniel Peeters, Alexander Sadlo, Oliver Mendoza, Dariusz Mitoraj, Dennis Friedrich, Anjana Devi, Radim Beranek, Rainer Eichberger
The Transport Pathways of Charge Carriers in CuWO₄ for Photocatalysis
- 15:45 - 16:00 Discussion
- 16:00 - 16:30
S2.1-I2 Vladimir Smirnov (*IEK5-Photovoltaics, Forschungszentrum Jülich, 52425 Jülich, Germany*), Katharina Welter
Multijunction Si Solar Cells for Integrated Photo-Electrochemical Devices
- 16:30 - 16:45
S2.1-O4 Jens Melder (*Institut für Anorganische und Analytische Chemie und Freiburger Materialforschungszentrum (FMF), Albert-Ludwigs-Universität Freiburg, Albertstraße 21, 79104 Freiburg*), Stefan Mebs, Philipp Heizmann, Holger Dau, Philipp Kurz
Electrochemical Water Oxidation by MnO_x/CFP – pH Dependence of the Catalytic Activity
- 16:45 - 17:00
S2.1-O5 Alfred Ludwig (*Institute for Materials, Ruhr-Universität Bochum, D-44801 Bochum, Germany*), Mona Nowak, Swati Kumari, Helge S. Stein, Ramona Gutkowski, Joao Junqueira, Wolfgang Schuhmann
Combinatorial Fabrication and High-Throughput Characterization of Thin Film Metal Oxide Libraries for Solar water Splitting
- 17:30 - 19:00 **Poster Session**

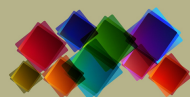
October 25th - Day 4 (Thursday)

Plenary Session 5

- 09:00 - 09:30
5-K1 Maksym Kovalenko (*Institute of Inorganic Chemistry, Department of Chemistry and Applied Bioscience, ETH Zurich, 8093 Zurich, Switzerland*)
Colloidal Nanocrystals of APbX₃ Perovskites [A=Cs⁺, CH(NH₂)₂⁺, X=Cl⁻, Br⁻, I⁻]: Surface Chemistry, Self-Assembly and Potential Applications

WatSpl S2.2

- 09:00 - 09:30
S2.2-I1 Sophia Betzler, Thomas Gänsler, Katharina Hengge, Anna Frank, Siyuan Zhang, Christina Scheu (*Max-Planck-Institut für Eisenforschung Düsseldorf*)
Nb₃O₇OH Nanoarrays for Photocatalytic Water Splitting: Defects, Dopants, and Stability of co-Catalysts



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Torremolinos-Spain

October 22-26, 2018



nanoGe

- 09:30 - 09:45 **Emanuel Ronge** (*University of Goettingen*), Vladimir Roddatis, Jonas Ohms, Philipp Kurz, Christian Jooss
S2.2-O3 In-Situ Transmission Electron Microscopy Analysis of a Calcium-Birnessite Water-Oxidation Catalyst
- 09:45 - 10:00 **Thorben Petersen** (*Carl von Ossietzky University Oldenburg*), Thorsten Klüner
S2.2-O4 Quantum Chemical Investigation of Water Splitting on ideal TiO₂-Anatase(101)
- 10:00 - 10:15 **Alexander Möllmann** (*Department of Chemistry, Inorganic Chemistry, University of Cologne*), Jennifer Leduc,
S2.2-O1 Lasse Jürgensen, Thomas Fischer, Yakup Gönüllü, Sanjay Mathur
Oxide Bilayers as High Efficiency Water Oxidation Catalysts through Electronically Coupled Phase Boundaries
- 10:15 - 10:30 **Sasa Lukic** (*Nanoparticle Process Technology (NPPT), Institute for Combustion and Gas Dynamics, University
S2.2-O2 of Duisburg-Essen, 47057 Duisburg, Germany*), Jasper Menze, Martin Muhler, Markus Winterer
Generation of Zinc-Gallium-Oxynitride Nanoparticles from CVS Powders for Photocatalytic Water Splitting

10:30 - 11:00 Coffee Break

WatSpl S2.3

- 11:00 - 11:30 **Kristin Kirchberg, Roland Marschall** (*Justus Liebig University Giessen*)
S2.3-I1 Nanostructured Spinel Ferrite Materials for Photoelectrochemical Water Splitting
- 11:30 - 11:45 **Hyo-Jin Ahn** (*University of Erlangen-Nürnberg*), Anandarup Goswami, Francesca Riboni, Stepan Kment, Alberto
S2.3-O1 Naldoni, Radek Zboril, Patrik Schmuki
A Strategy to Decrease the High Onset Potential of Hematite Photoanodes by Gradient Doping and Decoration with Zn-Co Layered Double Hydroxide
- 11:45 - 12:00 **Hong Nhan Nong** (*Dept. of Chemistry, Technical University Berlin, Strasse des 17. Juni 124, TC 03, 10623
S2.3-O2 Berlin, Germany*), Tobias Reier, Paul Paciok, Detre Teschner, Marc Heggen, Valeri Petkov, Robert Schlögl,
Travis Jones, Peter Strasser
Operando Studies of Hole-Doped IrNiOx core-shell electrocatalysts for Water Oxidation in acidic Environment
- 12:00 - 12:15 **Maria Eugenia Toimil-Molares** (*GSI Helmholtz Centre for Heavy Ion Research*), Florent Yang, Dimitri Korjakin,
S2.3-O3 Christina Trautmann, Christopher Schröck
Photoelectrochemical Performance of Arrays of Cu₂O/TiO₂ and Au/Cu₂O/TiO₂ Nanowires Fabricated by Electrodeposition
- 12:15 - 12:30 **Cora Bubeck** (*University of Stuttgart, Institute for Material Science, Heisenbergstraße 3, 70569 Stuttgart,
S2.3-O4 Germany*), Marc Widenmeyer, Gunther Richter, Mauro Coduri, Eduardo Salas Colera, Songhak Yoon, Frank
Osterloh, Anke Weidenkaff
Perovskite-type Oxynitrides LaTaO₂N and LaTaON₂ – Synthetic Strategies

12:30 - 14:30 Lunch

14:30 - 16:00 Internal Project Meeting

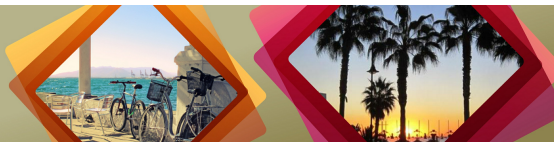
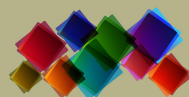
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- 16:00 - 16:30 **Matthias M. May** (*University of Heidelberg*)
S2.4-I1 Challenges and Opportunities of Water Splitting with Multi-Junction Solar Absorbers
- 16:30 - 16:45 **Laurent Pedesseau** (*Univ Rennes, INSA Rennes, CNRS, Institut FOTON - UMR6082, F-35000 RENNES*), Ida
S2.4-O1 Lucci, Simon Charbonnier, Maxime Vallet, Pascal Turban, Yoan Leger, Tony Rohel, Nicolas Bertru, Antoine
Létoublon, Jean-Baptiste Rodriguez, Laurent Cerutti, Eric Tournié, Anne Ponchet, Gilles Patriarche, Charles
Cornet
GaP Template on Si for Solar Water Splitting: Surface Energy Engineering
- 16:45 - 17:00 **Peter Cendula** (*University of Zilina*), Matthew T. Mayer, Jingshan Luo, Linfeng Pan, Michael Grätzel
S2.4-O2 Elucidation of Photovoltage Enhancements and Charge Transport in Multijunction Cu₂O Photocathode through
Semiconductor Simulations

17:30 - 19:00 Poster Session

October 26th - Day 5 (Friday)

Plenary session 6



09:00 - 09:30 Marina Leite (*University of Maryland*)
6-K1 Probing Solar Cells at the Nanoscale through Real-Time Functional Imaging

WatSpl S2.5

09:30 - 10:00 Laurence Peter (*Department of Chemistry, University of Bath*), - Gurudayal, Lydia Helena Wong, Fatwa Abdi
S2.5-O1 Understanding the Role of Nanostructuring in Photoelectrode Performance for Light-Driven Water Splitting

10:00 - 10:15 Shababa Selim (*Imperial College London, Department of Chemistry, South Kensington Campus, London, SW7*
S2.5-O2 2AZ), Laia Francas, Camilo Mesa, Andreas Kafizas, Dongho Lee, Kyoung-Shin Choi, James R. Durrant
Investigating the Influence of Nanostructuring on Photoanode Performance

10:15 - 10:30 Fanxing Xi (*Helmholtz Zentrum Berlin für Materialien und Energie GmbH*), Peter Bogdanoff, Sebastian Fiechter
S2.5-O3 Activation of amorphous MoS_x as a hydrogen evolving catalyst in aqueous electrolysis

WatSpl S2.6

11:00 - 11:30 Krishnan Rajeshwar (*The University of Texas at Arlington*)
S2.6-O1 New Families of Ternary Rare Earth Chalcogenides for Photoelectrochemical Applications

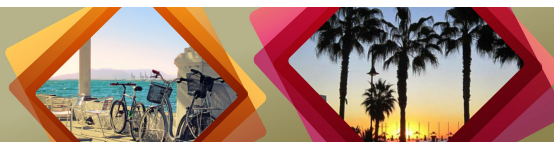
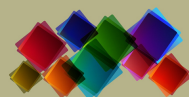
11:30 - 11:45 Wolfgang Schuhmann (*Analytical Chemistry–Center for Electrochemical Sciences (CES), Ruhr-Universität*
S2.6-O2 *Bochum, D-44801 Bochum, Germany*), Ramona Gutkowski, Joao Junqueira, Tim Bobrowski, Olga Krysiak
Improving the Photoelectrocatalytic Activity of Metal-Doped BiVO₄-Based Photoabsorbers by Means of Oxygen
Evolution Co-Catalysts

11:45 - 12:00 Sixto Gimenez (*Institute of Advanced Materials (INAM), University Jaume I, Avenida de Vicent Sos Baynat, s/n,*
S2.6-O3 *12006 Castelló de la Plana, Castellón (Spain)*)
Water Oxidation with Metal Oxide Semiconductor Materials

12:00 - 12:30 Bruce Parkinson (*Department of Chemistry, University of Wyoming, Laramie, WY, USA*)
S2.6-O4 The Past, Present and Future of Solar Fuels

Poster Contribution

- 032 Jonathan Kampmann (*Ludwig-Maximilians-Universität (LMU) München*), Torben Sick, Alexander Hufnagel, Ilina Kondofersky, Markus Döblinger, Kristina Peters, Daniel Böhm, Dina Fattakhova-Rohlfing, Thomas Bein
Conjugated 2D Covalent Organic Framework Thin Films as novel Absorber Material for Photoelectrochemical Hydrogen Evolution
- 037 Dennis Zywitzki (*Inorganic Materials Chemistry, Ruhr-University Bochum, 44801 Bochum, Germany*), Dereje Taffa, Jiyeon Kim, Michael Wark, Radim Beranek, Anjana Devi
Vapor Phase Deposited Cobalt Oxide: A Highly Versatile Material System for Photoelectrochemical Water Splitting
- 045 Katharina Welter (*Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research – 5 Photovoltaics, 52425 Jülich (Germany)*), Niloofar Hamzelui, Vladimir Smirnov, Jan-Philipp Becker, Wolfram Jaegermann, Friedhelm Finger
Catalysts from Earth Abundant Materials in a Scalable, Stand-Alone Photovoltaic-Electrochemical Module for Solar Water Splitting
- 048 Ting Zhang (*Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC and BIST, Campus UAB, Bellaterra, 08193 Barcelona, Spain*), PengYi Tang, JunShan Li, ZhiShan Luo, Yong Zuo, JunFeng Liu, Jordi Llorca, Andreu Cabot, Jordi Arbiol
NiSn Bimetallic Nanoparticles as Stable Electrocatalysts for Methanol Oxidation Reaction
- 053 Thomas Teusch (*Carl von Ossietzky University Oldenburg*), Thorsten Klüner
Adsorption and Dissociation of Water on Tungsten Trioxide (001)
- 055 Sebastian Fiechter (*Institute for Solar Fuels, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner-Platz 1, 14109 Berlin, Germany*), Philipp Hillebrand, Lichao Jia, Moritz Kölbach, Peter Bogdanoff
Photoelectrodeposition of Amorphous Cobalt and Manganese Oxide Hydroxides onto Fe₂WO₆ Photoelectrodes
- 057 Dereje Taffa (*Institute of Chemistry, Chemical Technology 1, Carl von Ossietzky University Oldenburg, Carl-von-Ossietzky-Str. 9-11, 26129 Oldenburg, Germany*), Sven Warfsmann, Michael Wark
Stoichiometrically Varied Electrodeposited Ferrite Films for Photoelectrocatalytic Oxidation of Water



- 063 Swati Kumari (*Chair for MEMS Materials, Institute for Materials, Ruhr-Universität Bochum*), João R. C. Junqueira, Ramona Gutkowski, Aleksander Kostka, Katharina Hengge, Mona Nowak, Christina Scheu, Wolfgang Schuhmann, Alfred Ludwig
Investigation of Vanadate-Metal-Oxide Thin Film Systems for Solar Water Splitting
- 072 Hamidreza Hajiyani, Rossitza Pentcheva (*Department of Physics, University of Duisburg-Essen, Germany*)
Role of surface orientation, termination and composition on the activity of $\text{Co}_x\text{Ni}_{1-x}\text{Fe}_2\text{O}_4$ as an anode material for OER: insights from DFT+U calculations
- 101 João Ricardo Coelho Junqueira (*Analytical Chemistry – Center for Electrochemical Sciences (CES), Ruhr-Universität Bochum, Universitätsstr. 150, D-44780 Bochum, Germany*), Tim Bobrowski, Olga Anna Krysiak, Ramona Gutkowski, Wolfgang Schuhmann
A Simple Method for Preparation and Optimisation of Mo-Modified BiVO_4 Photoabsorbers and the Influence of Oxygen Evolution Catalyst Addition on the PEC Performance
- 102 Iwona Grządka (*Faculty of Physics, Adam Mickiewicz University in Poznań, Umultowska 85, 61-614 Poznań, Poland*), Mateusz Gierszewski, Marcin Ziólek
Studies of Charge Transfers on TiO_2 Surface Sensitized with Ruthenium Complexes in Light-Driven Water Splitting Systems
- 113 Prince Bassi (*Institute for Solar Fuels, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner-Platz 1, 14109 Berlin, Germany*), Sebastian Fiechter
Assessing the Performance of Fe_2TiO_5 Based Photoelectrocatalyst Films Deposited through Different Synthesis Routes
- 121 Siyuan Zhang (*Max-Planck-Institut für Eisenforschung GmbH, Max-Planck-Straße 1, 40237 Düsseldorf, Germany*), Leo Diehl, Bettina Lotsch, Christina Scheu
 NiO_x Cocatalysts on Nanosheets for Photocatalytic Water Splitting
- 145 Lasse Jürgensen (*Department of Chemistry, Inorganic Chemistry, University of Cologne*), Alexander Möllmann, Jennifer Leduc, Thomas Fischer, Sanjay Mathur
Single-Source Precursors for Gas Phase Deposition of Catalytic Coatings for Water Splitting Applications
- 216 Martin Rohloff (*Institut für Anorganische und Analytische Chemie und Freiburger Materialforschungszentrum (FMF), Albert-Ludwigs-Universität Freiburg, Albertstraße 21, 79104 Freiburg*), Björn Anke, Anna C. Ulpe, Thomas Bredow, Martin Lerch, Anna Fischer
Fluorinated BiVO_4 Powder and BiVO_4 Thin Films – Fluorine Incorporation Yields Improved Light-Induced Water Oxidation Performance
- 237 Alexander Sadlo (*Inorganic Materials Chemistry, Ruhr University Bochum, Germany*), Anjana Devi
Fabrication of $\text{Ga}(\text{Sbx})\text{N}_{1-x}$ Photoanodes - A Potential Visible Light Absorber Material for Solar Water Splitting
- 244 Katarzyna Skorupska (*Department of Inorganic Chemistry, Fritz-Haber-Institut der Max-Planck-Gesellschaft, Faradayweg 4-6, Berlin, 14195, Germany*), Travis E. Jones, Rik Mom, Detre Teschner, Michael Hävecker, Thomas Lunkenbein, Jens Melder, Philipp Kurz, Cheng-Hao Chuang, Axel Knop-Gericke, Robert Robert Schlögl
Approaches to In-Situ Measurements of Manganese Oxides Under OER
- 251 Rafael Abarques (*Institute of Materials Science of the University of Valencia (ICMUV)*), Miguel García-Tecedor, Jaime Noguera, Sixto Giménez, Pedro J. Rodriguez-Canto, Juan P. Martinez-Pastor
Printable NiO_x and Au-NiO_x Nanocomposite Thin Films with Enhanced Electrocatalytic Performance for Water Oxidation
- 253 Francesca Maria Toma (*Joint Center for Artificial Photosynthesis and Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA*), Guiji Liu
Accelerated Discovery of Functional Light Absorber/Catalyst Interfaces
- 269 Hoang Phi Tran (*AK Strasser, TU Berlin*)
Influence of doped tin oxide support on the formation, stability and activity of core – shell nanoparticles IrCo@IrO_x catalyst for water splitting.