

Prof. Dr. Patrik Schmuki

Swiss National Science Foundation PROFIL Fellowship

Fellow of the Electrochemical Society, USA

Fellow of the Royal Society of Chemistry

Honorary Professor for Physical Chemistry

at King Abdulaziz University

Fellow of the International Society of Electrochemistry

University of Erlangen-Nuremberg

Dept. for Mat. Sci., LKO

Martensstr. 7, D-91058 Erlangen

GERMANY

Tel: +49-9131-85 275 75

Fax: +49-9131-85 275 82

e-mail: schmuki@ww.uni-erlangen.de

<http://www.lko.uni-erlangen.de/>



>450 publications such as *Nature Materials*, *Nano Today*, *Angew. Chem. Int. Ed.*, *JACS*, *ACS Nano*, *Nano Lett.*, *Adv. Mater.*, an H-index of 69, and >18000 citations.

Professional Career

1988 Master of Science in Physical Chemistry University of Basel (Switzerland)

1992 PhD Swiss Federal Institute of Technology (ETH), Zürich (Switzerland)

1992 1992 Research Associate ETH-Zürich (Switzerland)

1994 1995 Brookhaven National Laboratory, Materials Science Division & Brookhaven National Light Source, Upton, NY (USA)

1995 1997 National Research Council, Institute for Microstructural Sciences, Ottawa (Canada)

1997 2000 Associate Prof. for Microstructuring of Materials, Department of Materials Science, EPFL, Lausanne (Switzerland)

since 2000 Full professor and chair for Surface Science and Corrosion University of Erlangen-Nürnberg (Germany)

since 2003 Several Research Stays Guest professor, University of Burgundy, Dijon (France)

since 2007 University of Erlangen-Nürnberg (Germany)

Editorial Activity

Member of following Editorial Boards:

Chemistry Open

Electrochemistry Communications

ElectrochimicaActa

ActaBiomaterialia

ChemElectroChem

Corrosion Reviews

Awards and Honors

1992 ETH medal for the PhD Thesis

1995 Swiss National Science Foundation Fellowship for Advanced Researchers

1997 Swiss National Science Foundation PROFIL Fellowship

2005 H.H. Uhlig Award of the NACE-International, USA

2008 Fellow of the Electrochemical Society, USA

2008 Volta Award of the Electrochemical Society, USA

2010 Reinhart Koselleckgrant (German Research Foundation) 1.5 Mio Euro

2011 H.H. Uhlig Award of the Electrochemical Society, USA

2012	Fellow of the Royal Society of Chemistry
2013	ERC-Grant for Advanced Researchers 2.5 Mio Euro
2013	Honorary Professor for Physical Chemistry at King Abdulaziz University, Saudi Arabia
2013	Fellow of the International Society of Electrochemistry

Publications and Invitations to Meetings

Patrik Schmuki has a track record that includes >450 publications, an H-index of 69, and >18000 citations. On the list of publications are, for example, numerous *Angewandte Chemie Int. Ed.*, *JACS*, *Advanced Materials*, *Nano Letters*, and *Nature Materials*. His research has been outlined in journal covers and his publications include many most cited papers.

List of Selected Publications

1. *Nature Materials*, 11 (2012) 162-167
2. Kowalski, Damian; Kim, Doohun; P. Schmuki: TiO₂ nanotubes, nanochannels and mesosponge: Self-organized formation and applications *NANO TODAY*, 2013, 8, 235-264.
3. Liu, Ning; Lee, Kiyong; P. Schmuki: Reliable Metal Deposition into TiO₂ Nanotubes for Leakage-Free Interdigitated Electrode Structures and Use as a Memristive Electrode *Angew. Chem. Int. Ed.*, 2013, 52, 12381-12384
4. So, Seulgi; P. Schmuki: Fast Electron Transport and High Surface Area: Potential Application of Porous Anatase Single Crystals in Solar Cells *Angew. Chem. Int. Ed.*, 2013, 52, 7933-7935.
5. Yoo, Jeong Eun; Lee, Kiyong; Altomare, Marco; et al. Self-Organized Arrays of Single-Metal Catalyst Particles in TiO₂ Cavities: A Highly Efficient Photocatalytic System *Angew. Chem. Int. Ed.*, 2013, 52, 7514-7517.
6. Lee, Chong-Yong; Lee, Kiyong; P. Schmuki: Anodic Formation of Self-Organized Cobalt Oxide Nanoporous Layers *Angew. Chem. Int. Ed.*, 2013, 52, 2077-2081.
7. Enabling the anodic growth of highly *Angewandte Chemie - International Edition*, 50 (2011) 9071-9075
8. *Angew. Chem. Int. Ed.*, 50 (2011) 2904-2939
9. Y.- *-induced payload Angew. Chem. Int. Ed.*, 49 (2010) 351-354.
10. R. Hahn, F. Schmidt-Stein, J. Salonen, S. Thiemann, Y.-Y. Song, J. Kunze, V.-P *Angew. Chem. Int. Ed.* 48 (2009) 7236 7239
11. Non-Thickness-Limited Titanium Dioxide Mesosponge and its Use in Dye- *Angew. Chem. Int. Ed.* 48 (2009) 9326-9329.
12. *-doped TiO₂ Angew. Chem. Int. Ed.* , 47 (2008) 7934-7937.
13. A. Ghicov, J.M. Macak, H. Tsuchiya, J. Kunze, V. Haeublein, L. Frey and P. *-Doping of TiO₂*

14. A. -Nb2O5
Ed. 2006, 45, 6993-6996
15. -Aspect-Ratio TiO₂ Nanotubes
Chem. Int. Ed. 44 (2005) 2100.
16. W. Wei, H. Jha, G. Yang, R. Hahn, I. Paramasivam, S. Berger, E. Spiecker, P. -organized superlattice nanotube arrays-embedding
Adv Mater., 22 (2010) 4770-4774.
17. P. Roy *J. Am. Chem. Soc.*, 133 (2011) 5629-5631
18. -selective separation of macromolecules by nanochannel titania membrane with self-cleaning
J. Am. Chem. Soc., 132 (2010) 7893-7895.
19. K. Lee, D. Kim, P. Roy, I. Paramasivam, B. I. Birajdar, E. Spiecker, P. Schmuki -efficiency
J. Am. Chem. Soc., 132 (2010) 1478-1479.
20. Waldmann, Daniel; Butz, Benjamin; Bauer, Sebastian; et al. Robust Graphene Membranes in a Silicon Carbide Frame *ACS NANO*, 2013, 7, 4441-4448.
21. S. P. Albu, A. Ghicov, J. M. Macak, R. Hahn, P. S -Organized, Free-Standing TiO₂ Nanotube Membrane for Flow-through Photocatalytic
22. adsorption of oxygen on TiO₂ nanotube arrays: Influence of crystal structure
Nano Letters 7 (2007) 1091
- 23.
24. Dependent Activation of Endothelial Cell Growth and Differentiation on TiO₂
Nano Lett., 9 (2009) 3157-3164.
25. dictated solely by altered nanotube dimension" *PNAS Lett.*, 106 (2009) 1.
26. Y. Yang, K. Lee, M. Zobel, M. MacKovic, T. Unruh, E. Spiecker, P. Schmuki:
Advanced Materials, 24 (2012) 1571-1575
27. Lee, Kiyong; Hahn, Robert; Altomare, Marco; et al. Intrinsic Au Decoration of Growing TiO₂ Nanotubes and Formation of a High-Efficiency Photocatalyst for H₂ Production *Adv. Mater.*, 2013, 25, 6133-6137.
28. -Organized Zirconium Titanate
29. Nanotubes by Self-
3027
30. J. M. Macak, C. Zollfrank, B. J. Rodriguez, H. Tsuchiya, M. Alexe, P. Greil, P. *Adv. Mater.*, 21 (2009) 3121-3125.

31. S.P. Albu, A. Ghicov, S. Aldabegerova, P. Drechsel, D. LeClere, G.E.
Adv. Mater., 20 (2008) 4135-4139.
32. Y. Y. Song, F. Schmidt-
 self-cleaning platform for high-sensitivity immunoassays *Small*, 6 (2010) 1180-
 1184.
33. J. Park, S. Bauer, A. Pittrof, M.S. Killian, P. Schmuki, K. Von Der Mark:
Small, 8
 (2012) 98-107

International Conferences

Patrik Schmuki is a frequent *invited keynote speaker* at international conferences and has given numerous keynote and >100 invited talks, including 8 at the Gordon Research Conferences. He is a *conference and symposium organizer* at The Electrochemical Society (ECS), The International Society for Electrochemistry (ISE), Porous Semiconductor Science & Technology (PSST), etc.

Excellence in Research

Patrik Schmuki belongs to leading electrochemists in the world, especially in the field of electrochemical materials science. He has a very broad international experience and background [ETH-Zürich (Switzerland), Brookhaven Natl. Labs (USA), National Research Council (Canada), EPFL Lausanne (Switzerland), University of Erlangen-Nürnberg (Germany)]. He has made significant contributions in different disciplines of materials science: more than 300 research papers have been published in leading journals of their fields, for example in physics (Physical Review Letter), chemistry (Angewandte Chemie, JACS), materials science (Advanced Materials, Nature Materials), and nanotechnology (Nano Letters, Small). His key expertise is in the fields of micro-/nanostructures, surfaces/interfaces, thin film characterization, electrochemistry, photochemistry, and semiconductor chemistry. He has carried out pioneering work on the electrochemical growth of self-organized nanotubular transition metal oxide layers, their synthesis, properties, and applications. He demonstrated the first time controlled synthesis of high aspect ratio nanotubes (and now include oxide nanotube or nanopore formation on numerous metals such as Ta, Hf, W, Zr, Nb, V, as well as many alloys (for an overview, see Angewandte Chemie Int. Ed., 2011). Patrik Schmuki has developed the deep understanding of growth mechanisms (Nature Materials, 2012) necessary to create self-organized oxide systems. Furthermore, by tailoring the optical, electronic and chemical properties of the nanotube arrays, Patrik Schmuki has enabled innumerable important technological applications of these amazing structures, including templates for catalysts, solar cells, with increase electron mobilities.

-docs

throughout his research has greatly enriched the community. He has hosted many self-funded research fellows, with prestigious grants (Alexander von Humboldt, Marie-Curie, Japan Society for Promoting Science, Korean Science Foundation). 8 of the students and PostDocs, who carried out research under his supervision, now hold faculty positions.

Activities in International Societies

Patrik Schmuki is an active member of the Electrochemical Society (ECS) and of the International Society of Electrochemistry (ISE), holding many committee positions in these societies. From 2007-2008, he was member of the Board of Directors of the Electrochemical Society. From 2010-2011, he was Chair of the New Technology Committee of the Electrochemical Society. Moreover, he started as a member (2000-2005) of Corrosion Division of the Electrochemical Society, and then became Vice-Chair (2005-2006) and Chair (2007-2008) of the Division. He also served as a Chairman of the European Section of the Electrochemical Society from 2002-2004. Since 2010, he is Chair of Division 4 (Electrochemical Materials Science) of the International Society of Electrochemistry. From 1999-2009, he was a member of the Executive Committee of the International Corrosion Council.

Organization of International Conferences

Fall and Spring Meetings of the Electrochemical Society, since 1997
(various locations in Europe, the USA, and Canada), typically organizing one symposium in a year

Role in conference: Chairman and Symposium Organizer

Annual Meetings of the International Society of Electrochemistry

Role in conference: Symposium Organizer

Porous Semiconductor Science and Technology (PSST), 2008, 2010

Role in conference: Chair and Conference Organizer

5th Kurt-Schwabe Symposium (From Corrosion to Semiconductors), 2009, Erlangen

Role in conference: Chairman

Kyoto-Erlangen Symposium on Advanced Energy and Materials

2003, Erlangen, Chair: Patrik Schmuki

2006, Kyoto, Co-Chair: Patrik Schmuki

2009, Erlangen, Chair: Patrik Schmuki