

**Name:** Richard T. Haasch

**Research field of interest and experience:**

My research interests involve the use of surface sensitive spectroscopies such as X-ray photoelectron spectroscopy (XPS), Auger photoelectron spectroscopy (AES), and ultra-violet photoelectron spectroscopy (UPS) to study the chemical and electronic properties of material surfaces and interfaces. Current topics include the investigation of materials for electronics and energy conversion/storage applications.

**Professional Experience**

- 2012**            **Senior Research Scientist**, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL
- 1993**            **Spectroscopist**, Center for Microanalysis of Materials, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL
- 1991**            **Research Associate**, Center for Microanalysis of Materials, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL
- 1989**            **Postdoctoral Research Associate**, Materials Research Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL

**Professional Affiliations and Service**

- **Editor**, AVS Publication *Surface Science Spectra*: An international journal and database devoted to archiving spectra from surfaces and interfaces, **2010-present**.
- **Secretary**, AVS Applied Surface Science Division, **2009-present**.
- **Member**, AVS Science and Technology of Materials, Interfaces, and Processing, **1983-present**.
- **Referee**, *ACS Applied Materials & Interfaces, Applied Surface Science, Journal of Alloys and Compounds, Journal of Physical Chemistry, Journal of Power Sources, Journal of Vacuum Science and Technology A, Langmuir, Materials Chemistry and Physics, Materials & Design, Materials Science in Semiconductor Processing, Surface and Coatings Technology, Surface Science Spectra, Thin Solid Films, and Vacuum*.

**Education**

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|-------------|-------------------------|----------------------|-------|
| <b>1989</b> | University of Minnesota | Analytical Chemistry | Ph.D. |
| <b>1982</b> | Marquette University    | Chemistry            | B.S.  |

**Awards**

NSF DMS 9977482- Ralph G. Nuzzo, Richard T. Haasch, Ivan G. Petrov "Acquisition of a High-Resolution, Imaging X-ray Photoelectron Spectrometer for Materials Research-" National Science Foundation \$450,000. State of Illinois matching grant- \$250,000, 1999.

**Publications**

**Book Chapters**

1. R. T. Haasch, "X-ray Photoelectron Spectroscopy (XPS) and Auger Electron Spectroscopy (AES)," in *Practical Materials Characterization*, M. Sardela, ed., (Springer Science + Business Media, New York, 2014). ISBN 978-1-4614-9280-1. [doi:10.1007/978-1-4614-9281-8\\_3](https://doi.org/10.1007/978-1-4614-9281-8_3).
2. Z. Zhou, J. Park, J. E. Indacochea, R. W. Staehle, S. Hwang, N. Finnegan, and R. Haasch, "Effect of Lead on Passivation of Alloy 600 Surface," in *Passivation of Metals and Semiconductors, and Properties of Thin Oxide Layers*, P. Marcus and V. Maurice, eds., 425-430 (Elsevier Science, 2006). ISBN: 978-044452224-5. [doi:10.1016/B978-044452224-5/50067-6](https://doi.org/10.1016/B978-044452224-5/50067-6).
3. W. L. Gladfelter, D. C. Boyd, J.- W. Hwang, R. T. Haasch, R. K. Schulze, J. F. Evans, K.- L. Ho K. F. Jensen, "Organometallic chemical vapor deposition of aluminum nitride and aluminum metal," in *Metal-Metal Bonds and Clusters in Chemistry and Catalysis*, J.P. Fackler, ed., 215-230 (Springer Science + Business Media, New York, 1990). ISBN: 978-1-4899-2492-6 (eBook). [doi:10.1007/978-1-4899-2492-6](https://doi.org/10.1007/978-1-4899-2492-6).

**Selected Recent Peer-reviewed Research Articles**

1. C.-Y. Tang, R. T. Haasch, S. J. Dillon, "In situ X-ray Photoelectron and Auger Electron Spectroscopic Characterization of Reaction Mechanisms during Li-ion Cycling," *Chem. Commun.*, **52**, 13257 (2016). [doi:10.1039/C6CC08176B](https://doi.org/10.1039/C6CC08176B).

2. I. S. Kim, R. T. Haasch, D. H. Cao, J. T. Hupp, M. G. Kanatzidis, A. B. F. Martinson, "Amorphous ALD TiO<sub>2</sub> Compact Layers for Planar Perovskite Halide Solar Cells," *ACS Appl. Mater. Interfaces*, **8**(37), 24310 (2016). [doi:10.1021/acsami.6b07658](https://doi.org/10.1021/acsami.6b07658).
3. A. B. Mei, R. T. Haasch, A. Rockett, L. Hultman, I. Petrov, J. E. Greene, "Growth, Optical, and Electronic Transport Properties of Epitaxial VN<sub>x</sub>/MgO(001) (0.80 ≤ x ≤ 1.00) Layers Deposited by Reactive Magnetron Sputtering," *J. Mater. Chem. C*, **4**, 7924 (2016). [doi:10.1039/c6tc02289h](https://doi.org/10.1039/c6tc02289h).
4. J. A. Varnell, E. C. M. Tse, C. E. Schulz, T. T. Fister, R. T. Haasch, J. Timoshenko, A. I. Frenkel, A. A. Gewirth, "Identification of iron nanoparticles as active species for oxygen reduction in non-precious metal catalysts," *Nature Comm.*, **7**, 12582 (2016). [doi:10.1038/ncomms12582](https://doi.org/10.1038/ncomms12582).
5. N. Hellgren, R. T. Haasch, S. Schmidt, L. Hultman, I. Petrov, "Interpretation of X-ray Photoelectron Spectra of Carbon-Nitride Compounds: New Insights from *in situ* XPS," *Carbon*, **108**, 242 (2016). [doi:10.1016/j.carbon.2016.07.017](https://doi.org/10.1016/j.carbon.2016.07.017).
6. M. Asadi, K. Kim, C. Liu, V. Aditya Addepalli, P. Phillips, P. Abbasi, A. Behranginia, P. Yasaei, R. Haasch, P. Zapol, B. Kumar, R. F. Klie, J. Abiade, L. A. Curtiss, A. Salehi-Khojin, "Nanostructured transition metal dichalcogenide electrocatalysts for CO<sub>2</sub> reduction in ionic liquid," *Science*, **253**, 467 (2016). [doi:10.1126/science.aaf4767](https://doi.org/10.1126/science.aaf4767).
7. A. Ashraf, Y. Wu, M. C. Wang, K. H. Yong, T. Sun, Y. Jing, R. T. Haasch, N. R. Aluru, S. Nam, "Doping-Induced Tunable Wettability and Adhesion of Graphene," *Nano Lett.*, **16**(7), 4708 (2016). [doi:10.1021/acs.nanolett.6b02228](https://doi.org/10.1021/acs.nanolett.6b02228).
8. S. Babar, A. U. Mane, A. Yanguas-Gil, E. Mohimi, R. T. Haasch, J. W. Elam, "W:Al<sub>2</sub>O<sub>3</sub> nanocomposite thin films with tunable optical properties prepared by atomic layer deposition," *J. Phys. Chem. C*, Article **120**(27), 252 (2016). [doi:10.1021/acs.jpcc.6b03823](https://doi.org/10.1021/acs.jpcc.6b03823).
9. J. C. Koepke, J. D. Wood, Y. Chen, S. W. Schmucker, X. Liu, N. N. Chang, L. Nienhaus, J.-W. Do, E. A. Carrion, J. Hewaparakrama, A. Rangarajan, I. Datye, R. Mehta, R. T. Haasch, M. Gruebele, G. S. Girolami, E. Pop, and J. W. Lyding, "Role of Pressure in the Growth of Hexagonal Boron Nitride Thin Films from Ammonia-Borane," *Chem. Mater*, **28**(12), 4169 (2016). [doi:10.1021/acs.chemmater.6b00396](https://doi.org/10.1021/acs.chemmater.6b00396).
10. R. F. McCarthy, M. S. Weimer, R. T. Haasch, R. D. Schaller, A. S. Hock, A. B. F. Martinson, "V<sub>x</sub>In<sub>(2-x)</sub>S<sub>3</sub> Intermediate Band Absorbers Deposited by Atomic Layer Deposition," *Chem. Mater.*, **28**(7), 2033 (2016). [doi:10.1021/acs.chemmater.5b04402](https://doi.org/10.1021/acs.chemmater.5b04402).
11. D. J. Wetzal, M. A. Malone, R. T. Haasch, Y. Meng, H. Vieker, N. T. Hahn, A. Golzhauser, J.-M. Zuo, K. R. Zavadil, A. A. Gewirth, R. G. Nuzzo, "Passivation Dynamics in the Anisotropic Deposition and Stripping of Bulk Magnesium Electrodes During Electrochemical Cycling," *ACS Appl. Mater. Interfaces*, **7** (33), 18406 (2015). [doi:10.1021/acsami.5b04487](https://doi.org/10.1021/acsami.5b04487).
12. J.-W. Do, N. N. Chang, D. Estrada, F. Lian, H. Cha, X. J. Duan, R. T. Haasch, E. Pop, G. S. Girolami, J. W. Lyding, "Solution-Mediated Selective Nanosoldering of Carbon Nanotube Junctions for Improved Device Performance," *ACS Nano*, **9** (5), 4806 (2015). [doi:10.1021/nn505552d](https://doi.org/10.1021/nn505552d).
13. J. Chang R. T. Haasch, J. Kim, T. P. Spila, P. V. Braun, A. A. Gewirth, and R. G. Nuzzo, "The Synergetic Role of Li<sup>+</sup> during Mg Electrodeposition/Dissolution in Borohydride Diglyme Electrolyte Solution: Voltammetric Stripping Behaviors on a Pt microelectrode Indicative of Mg-Li Alloying and Facilitated Dissolution," *ACS Appl. Mater. Interfaces*, **7** (4), 2494 (2015). [doi:10.1021/am507375t](https://doi.org/10.1021/am507375t).
14. J. Wood, G. P. Doidge, E. A. Carrion, J. C. Koepke, J. Kaitz, I. Datye, A. Behnam, J. Hewaparakrama, B. Aruin, Y. Chen, H. Dong, J. A. Kaitz, R. T. Haasch, J. Lyding, E. Pop, "Annealing Free, Clean Graphene Transfer using Alternative Polymer Scaffolds," *Nanotechnology*, **26**, 055302 (2015). [doi:10.1088/0957-4484/26/5/055302](https://doi.org/10.1088/0957-4484/26/5/055302).