

ROBERT O. SAVINELLI

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OBJECTIVE

I'm seeking a challenging industrial or postdoctoral position where I can apply my skills to solve energy related problems. I intend to have a leadership role in the rapidly changing dynamics between business, energy, and the environment.

PRESENT POSITION

I am currently a Ph.D. candidate in the department of chemistry and biochemistry at the University of California in Santa Barbara. My current work is supervised by Professor Susannah L. Scott and has been funded by the US Department of Energy's Hydrogen Fuel Initiative and by the National Science Foundation through the Partnership for International Research and Education in Electron Chemistry and Catalysis at Interfaces.

EDUCATION

Ph.D. Chemistry	University of California, Santa Barbara	2009 (Anticipated)
B.A. Chemistry	The Colorado College	2000 (A.C.S. certified)

PROFESSIONAL EXPERIENCE

University of California, *Research assistant*, Advisor: Prof. Susannah L. Scott (Dec 2004 – present)

Ph.D. Research. “**The deactivation of Mo₂C catalysts during carbon deposition**”, encompasses catalyst synthesis, characterization, and water-gas shift activity with an emphasis on the study of surface carbon deposits using X-ray photoelectron spectroscopy (XPS).

Lab Responsibilities. Website design, Catlab microreactor operation/training, and XPS training.

Synchrotron Experience. I have collected *ex-situ* and *in-situ* X-ray absorption spectra during work at the:

Stanford Synchrotron Radiation Lightsource (Palo Alto, CA, 2005 – 2009)

Advanced Photon Source (Argonne, IL, 2005)

Dalian Institute of Chemical Physics, *Visiting researcher*, Advisor: Prof. Bao Xinhe (Jun 2006 – Nov 2006)

State Key Laboratory of Catalysis. Research was conducted in northeastern China.

“**Olefin metathesis under flowing conditions on supported Mo₂C catalysts**”

“**Mo/H-ZSM5 site modeling of methane to benzene catalysts using X-ray absorption spectroscopy**”

Chinese Technology Study Tour. I coordinated with the Technology Management Program at UCSB and DICP, to organize a 5 day study tour of Microsoft, The BP Clean Energy Centre / Tsinghua University, Capital Steel, The National Science Foundation, Kodak, General Electric, Accelergy, UOP, BP-SECCO, and BASF in Beijing and Shanghai. In total 22 students and 2 professors attended the tour in China. (2007)

Workshops and Conferences

21st North American Catalysis Society meeting, San Francisco, CA (2009)

Grand challenges in electron chemistry and catalysis at interfaces workshop, UCSB, CA (2008)

Gordon Research Conference on Catalysis, Colby Sawyer College, NH (2008)

National Science Foundation meeting of principal investigators, Arlington, VA, (2007)

Workshop on Electron Chemistry and Catalysis, Dalian, China (2007)

12th US China Joint Commission Meeting on Science and Technology, Beijing, China (2006)

13th Chinese Catalysis Society national meeting, Lanzhou, China (2006)

Techniques of Surface Science and Catalysis summer school, UCSB, CA (2006)

Workshop on Hydrogen Fuel cells for Utility and Transportation Applications, LANL, NM (1996)

Nusil Silicone Technology R &D, *Synthetic chemist*, CA (Jun 2004 – Sep 2004)

I received ISO 9001 training in synthetic silicone chemistry and worked on a number of projects to make materials with specific elastomeric properties which could be scaled up for the production of specialty polymers used in the medical industry.

Kaplan, *MCAT and DAT instructor*, CA (Jan 2004 – Feb 2006)

I taught lessons in general chemistry, organic chemistry, math, verbal skills, and perceptual ability to college seniors preparing for entrance exams into medical and dental school.

Santa Barbara Public School District, *Substitute teacher*, Ca (Mar 2004 – Jun 2004)

Prior to joining Nusil, I worked as a substitute high school and middle school teacher.

Avinoak, *Solar technician*, CA (May 2003 – Feb 2004)

I installed solar heating and PV systems.

Blue Star EMEX, *Technical staff member*, CO (Jun 2001 – Dec 2002)

I was directly involved with the preparation and testing of cobalt based Fisher Tropsch catalysts and contributed to the design, fabrication, and operation of Blue Star's natural gas to diesel pilot plant. I prepared and screened prospective catalysts at high temperature, and pressure in bench reactors controlled using NI Lookout. I used GC, NDIR, GC-MS, TOC, and tested pour point, cloud point, and lubricity when analyzing reactant gases and liquid products.

Northeastern University, *Teaching assistant*, MA (Sep 2000 – Mar 2001)

I taught general chemistry recitations and took classes in inorganic chemistry.

EXPERIMENTAL SKILLS

X-ray Photoelectron Spectroscopy, (**XPS**) - Kratos Axis Ultra X-ray Photoelectron Spectrometer

X-ray Powder Diffraction Spectroscopy, (**XRD**) – Scintag, Philips Norelco, and Bruker diffractometers

In-situ X-ray absorption Spectroscopy, (**XANES** and **EXAFS**) - SSRL and APS

Operando Fourier Transform Infrared Spectroscopy, (**FTIR**) - Shimadzu IR Prestige Spectrometer

Mass Spectrometry, (**MS**) – Hiden HPR-20, Balzers, and Hewlett Packard Spectrometers

Gas Chromatography, (**GC**) - Hewlett Packard 5890, Shimadzu 2010, Shimadzu GC-8, and Buck 910

Brunauer, Emmett, Teller Surface area analysis, (**BET**) -Micrometrics Tristar 3000

Tapered Element Oscillating Microbalance, (**TEOM 1500 PMA**) flow reactor - catalysis and mass change

Thermo Gravimetric Analysis, (**TGA**) - Mettler TGA/sDTA851e Thermo-Gravimetric Analyzer

COMPUTER SKILLS

Proficient on Windows XP, DOS, Linux, and Macintosh operating systems running: Adobe Photoshop CS2, Athena, Atoms, Casa XPS 2.2, ChemDraw 9, Chem3D 9, CorelDraw 12, Crystallmaker, Dreamweaver 04, Endnote 8, Excel 03, Feff 8, HP ChemStation, Kaleidagraph 4, X'Pert High Score 2, PowerPoint 03, Shimadzu IR Solution, SolidWorks 2000, TKatoms, WinXAS 3.1, Visio 2000, and Word 03.

BOARDS, COMMITTEES, AND DEPARTMENTAL INVOLVEMENT

Graduate Recruitment. *Oral presentation* Partnership For International Research And Education Electron Chemistry And Catalysis At Interfaces. (2008)

Graduate student representative. Chemistry department, student compensation committee, successfully passed a 20 % increase in student salaries. (2008)

Founding director and vice president. Energy Forum, UCSB, a student organization that hosted lectures on energy related topics. I also created their website: <http://www.energyforumucsb.com>. (2008)

Poster session organizer. Graduate student recruitment committee. (2006)

PUBLICATIONS

Savinelli, R. O.; Li J.; Seshadri, R.; Scott, S. L. "Molybdenum Carbide and Oxycarbide Hydrogen Production Catalysts: Preparation, Characterization, and Evaluation." *NACS 21st NAM Proceedings: Abstracts*, **2009**.

Savinelli, R. O.; Li, J.; Seshadri, R.; Scott, S. L. "The effects of synthesis temperature, H₂ treatment, air exposure, and extended storage on the surface composition of Mo₂C powders." **2009** Manuscript in progress.

Savinelli, R. O.; Scott, S. L. "Analysis of high resolution C 1s X-ray Photoelectron spectra of Mo₂C powders." **2009** Manuscript written.

Page, K; Li, J.; Savinelli, R. O.; Szumila, H. N.; Zhang, J. P.; Stalick, J. K.; Proffene, T.; Scott, S.L.; Seshadri, R. "Reciprocal space and real-space neutron investigation of nanostructured Mo₂C and WC." *Solid State Sci.* **2008**, 10, 1499-1510.

Borsa A. G.; Harford, S. T.; Zhang J. Z.; Savinelli, R. O. "Detailed 3D Computer Model of a Pilot Plant Multi-tubular Fisher-Tropsch Reactor: Experimental and Model Results" *AICHE Proceedings*, **2003**, New Orleans spring meeting.

PRESENTATIONS AND POSTERS

Savinelli, R. O.; Li J.; Seshadri, R.; Scott, S. L. "Molybdenum Carbide and Oxycarbide Hydrogen Production Catalysts: Preparation, Characterization, and Evaluation." *Poster Presentation*. North American Catalysis Society, 21st National Annual Meeting , San Francisco, CA June 7-12, **2009**.

Savinelli, R. O.; Li J.; Seshadri, R.; Scott, S. L. "Molybdenum Carbide: Synthesis, Characterization, and Catalytic Performance: TPre-MS, TGA, XPS, XRD, BET, SEM, and TEM." *Poster Presentation*. Gordon Research Conferences on Catalysis, Colby Sawyer College, NH June 22-27, **2008**.

Savinelli, R. O.; Li, J.; Sun, J.M.; Zhang, J.P.; Bao X.H.; Seshadri, R.; Scott S. L. "Study of Transition Metal Carbides for Use in Heterogeneous Water-gas Shift and Olefin Metathesis Reactions." *Oral and Poster Presentation*. Partnership for International Research and Education Principle Investigator update, National Science Foundation, Arlington, VA, October **2007**.

Savinelli, R.; Li, J.; Sun J.M.; Zhang, J.P.; Bao X.H.; Seshadri, R.; Scott S. L. “Extended Research Visit to Dalian Institute of Chemical Physics. Cyclopentylidene initiating sites for propylene metathesis over Mo₂C/Al₂O₃.” *Oral Presentation*. PIRE ECCI International Advisory Board Annual Meeting, Dalian Institute of Chemical Physics. Dalian, China June 29, **2007**.

Savinelli, R. O.; Li J.; Seshadri, R.; Scott, S. L. “XAS and XPS Characterization of Metal Carbide Catalysts.” *Oral Presentation*. US- China Partnership Workshop on Heterogeneous Catalysis and Surface Science. Dalian Institute of Chemical Physics. Dalian, China June 29, **2007**.

Savinelli, R. O. “Partnership for International Research and Education, A Student’s Perspective on Research in Dalian.” *Oral Presentation*. 12th US China Joint Commission meeting on Science and Technology, on behalf of the National Science Foundation, Beijing, China, October **2006**.

Savinelli, R.; Peoples, B.; Deguns, E.; Demmelmaier, C., Hisamoto, M.; Fleischman, S.; Moses, A.; Singh, U.; Leifeste, H.; Yung, C.; Chattopadhyay, S.; Scott, S. “Understanding the Relationship between Surface Structure and Catalytic Properties of Heterogeneous Catalysts” *Poster Presentation*. UCSB chemistry graduate recruitment **2006**.

ACADEMIC HONORS AND AWARDS

- 2009 Kokes award recipient from the North American Catalysis Society
- 2006 National Science Foundation PIRE award to study catalysis in China
- 2000 GAANN fellowship at Northeastern University
- 1998 Colorado College Dean’s list
- 1997 Howard Hughes Medical Institute scholarship recipient
- 1997 New Mexico Chapter of Mechanical Engineers award and scholarship
- 1997 Outstanding scholastic achievement - New Mexico State Department of Education
- 1997 United States Army certificate for an outstanding engineering project
- 1997 First Place, Naval Science award for distinguished achievement
- 1997 Second Place -Regional Science Fair -American Vacuum Society
- 1995 The Legislature of the State of New Mexico – excellence in leadership certificate
- 1995 Hugh O’Brian Youth Foundation certificate of outstanding leadership potential
- 94-97 National Forensic League Superior distinction for career in oratory and debate

INTERESTS AND ACTIVITIES

I enjoy running, skiing, and playing squash. I spend free time working with photos, studying languages, and website design. My interests include: nanostructured materials, three dimensional data storage systems, glycerol chemistry, scientific diplomacy between US and China, technology content on the Internet, characterization and deactivation of heterogeneous catalysts, the environmental impact of the energy extraction and use, and transportation policy. I am interested in using synchrotron XPS, TEM microscopy, Raman spectroscopy, microwave enhanced synthesis, high throughput screening, and ionic liquids.

REFERENCES

Available upon request.