

THE NUCLEUS

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Monthly Meeting

*Jeannette Brown to speak on
African American Women Chemists*

Summer Scholar Report

*Pd@Rh Core-Shell Nanostructures
for Electrochemical Energy Storage
By Casey Brodsky and Chia-Kuang
Tsung, Boston College*

Arno H. A. Heyn

*By Janice Meisenhelder-Heyn for
the presentation of the 2012
Arno Heyn Memorial Book Prize*

National Chemistry Week 2012

*A report by Christine Jaworek-Lopes,
NESACS Chair, National Chemistry Week*



Summer Scholar Report

Pd@Rh Core-Shell Nanostructures for Electrochemical Energy Storage

Casey Brodsky and Chia-Kuang Tsung, Merkert Chemistry Center, Boston College

Nanomaterials have a number of advantages in catalysis when compared to their bulk counterparts. As metal particle size reaches the nano scale, the surface area to volume ratio greatly increases along with the percentage of atoms occupying catalytically active corner and edge sites.¹ In the last fifty years, one of the most important focuses of nanomaterials research is the size and shape control of transition metal nanoparticles. Many methods controlling the size of transition metal nanoparticles have been reported. The latest research focuses on precise shape control. Shape control of transition metal nanoparticles is also a vital step in the search for alternative energy because the metal nanoparticle catalyst is at the center of improving the performance of water splitting, fuel cells, lithium batteries, and the production of cleaner hydrocarbons.

Rhodium is an active metal catalyst for a variety of chemical transformations, but little research has been done to develop shape-controlled nanomaterials composed of Rh. Compared to other noble metals it is difficult to manipulate Rh nanoparticles into shape-controlled structures. To resolve this problem, substrate nanocrystals of another metal, palladium, are used as structure-directing templates for Rh overgrowth in this study.

I worked with graduate student Brian Sneed, in Prof. Frank Tsung's group to develop syntheses for shape- and size-controlled palladium nanocubes and nanooctahedra, in addition to Pd@Rh core-shell nanostructures using the synthesized Pd nanoparticles as structure-directing substrates. The Rh coating was found to be epitaxial; the structure of the Rh overgrowth is controlled by the structure of the Pd onto which it was coated. This work, along with characterization and catalytic testing of the nanostructures, was

recently published by our group in The Journal of the American Chemical Society (JACS).² These Pd particles were also used in another project as active catalysts for the growth of ZIF-8 metal organic frameworks, also published by our group in JACS.³ Figure 1 shows transmission electron microscope (TEM) images of synthesized Pd and Pd@Rh particles.

The synthesized Pd@Rh nanostructures were tested as electrocatalysts to determine the particles' structure-dependent catalytic properties. This catalysis study is explained in greater detail in our paper.² Electrochemistry can be used as a powerful tool to probe the surface properties of metal nanoparticles, as many electrochemical reactions are surface structure-sensitive. As a result, these reactions can be used to determine or confirm characteristics about the surface structure of metal particles. In this study, we focused on carbon monoxide oxidation and formic acid oxidation. Both reactions are structure-sensitive and formic acid oxidation is being studied as a fuel source for hydrogen fuel cells.

Using the as-synthesized Pd@Rh nanoparticles as electrocatalysts resulted in very low activity. The surfactant and iodide used in the synthesis in order to create shape-controlled nanoparticles were strongly adsorbed on the particle surface and hindered the catalytic activity. To combat this problem, we modified a procedure from the literature to clean the particle surface by coating Cu₂O around the particles then etching it away.⁴ The Cu₂O displaces adsorbates from the surface, and the adsorbates are removed via centrifugation. Redispersing the coated particles in water etches away the Cu₂O and leaves a clean surface, free of adsorbates

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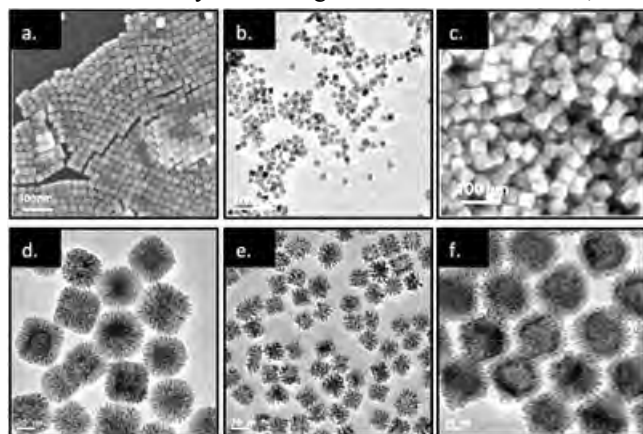


Figure 1: Transmission electron microscope (TEM) images of (a) 25 nm palladium cubes, (b) 12 nm palladium cubes, (c) 60 nm palladium octahedra, and (d), (e), (f) Rhodium overgrowth coated on the Pd particles in (a), (b), and (c), respectively.

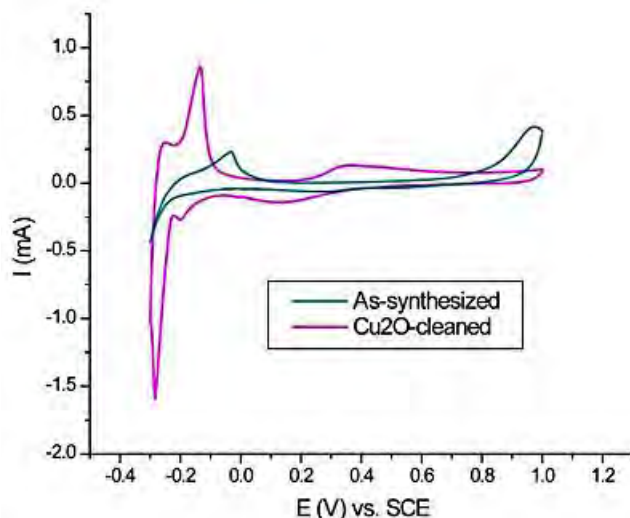


Figure 2: Cyclic voltammetry (CV) showing blank scans of Pd@Rh cubes, as-synthesized and Cu₂O-cleaned, in H₂SO₄.

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Cover: February Speaker Jeannette Brown, Merck (retired). Photo: Courtesy of Jeannette Brown

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Arno H. A. Heyn

Written and compiled by Janice Meisenhelder-Heyn for the presentation of the 2012 Arno Heyn Memorial Book Prize



Arno Heyn in 1995

Arno Heyn was born Oct. 6, 1918 in Breslau, Germany, now Wrocław, Poland, in the middle of a flu epidemic at the end of a World War. He was the son of an American father, a pharmaceutical chemist, and a German mother, an artist and pianist, who raised Arno in Germany. His mother

would practice the piano for hours each day, and Arno recalls playing with blocks under the grand piano. Although he never perfected his own piano skills, his love for classical music was engraved in his heart from those early childhood experiences. Arno's last year of high school was accelerated by a decree from Hitler designed to produce more young men ready for the military. Arno's father was already living in the US, when he graduated from high school in 1937.

Through his father's US birth Arno also had US citizenship and could leave Germany in 1937 to join his father in Detroit, where he enrolled in the University of Michigan, obtaining a B.S. in Chemistry in 1940 and a Ph.D. (analytical chemistry) in 1944 under the direction of Hobart Willard. Arno returned to Germany to visit family in the summer of 1939, and was about to leave Rotterdam when his passenger ship was confis-

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cated by the government. Hundreds of Americans were desperate to leave Europe, with long lines in front of the American Express office.

Arno checked the phone book to see that the main office of the Holland-American lines was in the industrial harbor district, and sought passage with a Freighter, instead of the obvious luxury liner. Only one other fellow had the same idea, and Arno secured passage to the US. He left Rotterdam on August 31, the day before France declared war. Although his freighter encountered a German U-boat and feared being torpedoed, he made it safely home. His advice was always: "Don't follow the crowd."

In his later years, Arno enjoyed frequent trips back to Europe and visits to his native homeland.

At the University of Michigan, Arno joined the University Choral Union, singing with the Philadelphia Orchestra under Eugene Ormandy

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Monthly Meeting

The 930th Meeting of the Northeastern Section of the American Chemical Society

Thursday, February 14, 2013

Northeastern University Boston Main Campus

Time	Event and Location
4:30–5:30 pm	Board Meeting room R230, building “140 The Fenway”
5:30-6:30 pm	Social Hour * lobby of the 2 nd floor in “140 The Fenway”
6:30-8:00 pm	Dinner (plated) room 378-379, building “140 The Fenway,
8:00-9:00 pm	Evening Talk room 378-379, building “140 The Fenway”

*(appetizers and soda only, no wine or other alcohol allowed in public space)

Dinner Reservations should be made no later than 12:00 noon, Friday, February 10th. Reservations are to be made using PayPal services: <http://acssymposium.com/paypal.html>. Select pay with credit or debit card option and follow the additional instructions on the page. Members, \$30; Non-members, \$35; Retirees, \$20; Students, \$10, Unemployed \$10. Reservations at no charge for new members only. For additional information contact the secretary, Anna Singer, between 9am and 6pm at (phone/fax 781-272-1966) or secretary@nesacs.org. Member will be charged for reservations not canceled at least 24 hours in advance.

THE PUBLIC IS INVITED ◇

Call for Nominations

Philip L. Levins Memorial Prize

Nominations for the Philip L. Levins Memorial Prize for outstanding performance by a graduate student on the way to a career in chemical science should be sent to the NESACS Administrative Secretary, 12 Corcoran Rd., Burlington MA 01803 by March 1, 2013.

The graduate student's research should be in the area of organic analytical chemistry and may include other

areas of organic analytical chemistry such as environmental analysis, biochemical analysis, or polymer analysis. Research emphasis must be on novel uses of analytical methods, not routine analysis.

Nominations may be made by a faculty member, or the student may submit an application. A biographical sketch, transcripts of graduate and undergraduate grades, a description of present research activity and three references must be included. The nomination should be specific concerning the contribution the student has made to the research and publications (if any) with multiple authors.

The award will be presented at the May 2013 NESACS meeting. ◇

Biography

Jeannette Elizabeth Brown is a former Faculty Associate in the department of Pre-College Programs at the New Jersey Institute of Technology. She held the title of New Jersey Statewide Systemic Initiative (NJSSI) Regional Director having served as the NJIT NJ/SSI Coordinator previously. In this position she designed, developed and coordinated the NJIT NJSSI K-8 Professional Development Program. Ms Brown is a Fellow (Cohort 3) of the WestEd National Academy for Science and Mathematics Leadership.

She previously held the position of Research Chemist and worked at Merck & Co. Inc for twenty-five years in that capacity. She synthesized new compounds for testing as potential new drug candidates for human and animal health. She suggested new targets for development. At Merck she was co-author of 15 publications and 5 patents and has one patent in her name alone. She earned a Management Award for her work with the Merck Black University Liaison Committee in which she worked with Grambling University to try to improve the chemistry department.

She started her industrial career at CIBA Pharmaceutical Co. as a junior chemist and worked there for eleven years. She has a M.S. degree from the University of Minnesota and a B.S. degree in chemistry from Hunter College. She was elected to the Hunter College Hall of Fame for her work as a mentor for young students.

She was appointed to the National Science Foundation Committee on Equal Opportunities for Women Minorities and Persons with Disabilities (CEOSE) and served on that committee for six years. She is a Councilor of the American Chemical Society from the North Jersey Section. She was Chair of the Project SEED Committee and reorganized the committee to make it function efficiently. She also acted as the chief fundraiser for the program until it was taken over by a professional fundraiser. She is a member of the National Organization for

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Task Force Vision 2025 Update

Several NESACS members have been tapped by ACS President-elect Dr. Marinda Wu to participate in a “piloting” task force she titled “Vision 2025: Helping ACS Members Thrive in the Global Chemistry Enterprise” at the beginning of her electoral term, meeting nearly monthly.

This short item shares the energy, enthusiasm and the commitment to focus the society’s efforts to be a benefit for members in our fast changing world.

Some of the leading trends identified were:

- Fewer chemistry-related jobs in the U.S. projected in the future; tighter job market and fewer chemistry career jobs
- Chemical enterprise is global; not strictly localized by markets and raw materials with other complicating factors
- Technical leadership in Chemistry is less clear for U.S.; continual need

for innovations to achieve progress

- Observed global population increases with attendant earth resource reduction and increased air and water pollution

Task Force Goals

1. Prepare ACS members for traditional chemistry and non-traditional careers advocating business creation, growth and expansion
2. Promote and enhance partnerships and exchanges to increase access to resources and jobs.
3. Engage our members in the initiatives

Emerging recommendations under consideration:

Two sub-committees were led by Sadiq Shah and H. N. Cheng, resulting in task force members meeting with 19 committees and divisions. They presented and ranked proposals and sought support for action, including:

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National Recognition for NESACS Student Chapters

The ACS Committee on Education has selected the following student chapters in the Northeastern Section to receive special recognition for the programs and activities described in their 2011-2012 reports:

Outstanding:

- Gordon College, Wenham, MA; Benjamin Stewart and Bria Pelletier, chapter co-presidents; Prof. Joel Boyd, faculty advisor.
- Northeastern University, Boston, MA; Christine Dunne and Elise Miner, chapter co-presidents; Prof. Kathleen Cameron, faculty advisor.

Commendable Recognition:

- Suffolk University, Boston, MA; Stephanie Laurer and Meaghan Sebeika, chapter co-presidents; Prof. Doris Lewis and Prof. Andrew Dutton, faculty advisors.

Honorable Mention:

- Stonehill College, North Easton, MA; Katherine O’Toole and Meghan Harley, chapter co-presidents; Profs. Cheryl Schmitzer and Marilena Hall, faculty advisors.

Student involvement in applying green chemistry principles and practices is essential to the integration of environmentally benign technologies in academia and industry. The ACS Green Chemistry Institute recognizes ACS student chapters that have engaged in at least three green chemistry activities during the academic year. Listed below are the 2011-2012 Green Chemistry Award recipients located within the Northeastern Section:

- Gordon College, Wenham, MA
- Northeastern University, Boston, MA

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ACS Senior Chemists Committee Created

The ACS Committee on Committees (ConC) is pleased to announce that the Council and Board of Directors have now officially approved the establishment of the Joint Board-Council Committee on Senior Chemists (SCC), effective January 1, 2013. The age demographics of the ACS demonstrated the need for a Senior Chemists Committee. Of its more than 164,000 members, more than 37% are over the age of 50 (as of Dec. 31, 2011), with this segment of the Society being one of the fastest growing groups.

SCC will be a group of highly professional volunteer chemists whose mission is to enrich the educational, technical, and cultural lives of the ACS membership while ministering to and employing the talents of senior ACS members (over the age of 50) in the following ways:

- sharing with ACS members of all ages a rich variety of personal experiences and expertise gained over many years of professional service;

Student Chapters

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- Suffolk University, Boston, MA

All chapters receiving special recognition will be honored at the 245th ACS National Chemistry Meeting in New Orleans, LA, on Sunday, April 7, 2013.

For the 2012-2013 academic year, the ACS Society Committee on Education has selected 15 Community Interactions Grant proposals to receive funding. Listed below is the recipient located within the Northeastern Section.

- Boston College, Chestnut Hill, MA; Douglas Brown, student project director; Prof. Eranthie Weerapana, faculty advisor. ◇

- fostering interest and participation in the science of chemistry through community outreach, especially in grades K-12;
- acting as science advisers / ambassadors for the purpose of cultural exchange at home and abroad;
- providing senior ACS members with challenging, diverse, and enjoyable professional experiences that enable them to contribute to the cultural experiences of their communities;
- recommending policies that address issues of interest to senior chemists.

SCC will initially consist of 15 members and such associates and consultants as the President and Chair of the Board of Directors deem necessary. And, as stipulated in the Bylaws for such committees, SCC will be "subject to review by ConC no less often than every five years to advise Council whether it should be continued." The Senior Chemists Task Force (SCTF) had formally requested that ConC review and evaluate its request for the establishment of SCC as a Joint Committee of the Board and Council. SCTF had been functioning as a quasi-

committee for three years, and was the culmination of more than a decade of task forces examining the need for a senior chemists committee. ConC acted on this request and brought a specific recommendation to Council in Philadelphia that the establishment of such a committee be approved subject to the concurrence of the Board of Directors.

SCTF believed the committee could serve two constituencies within the ACS: (1) seniors who are still active either as full-time or part-time employees, consultants, or those who still wish to stay closely connected to the ACS and its spectrum of activities; and (2) younger members and students who have questions about a chemistry-based career or who have started careers but are looking for guidance on how to progress. Examples of SCC activities are mentoring, career guidance and counseling, job training seminars and webinars, alternate career selection, problem support, workshops, and tutorials.

The new committee will hold its first meeting in New Orleans on Monday, April 8, 2013. ◇

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Karen Piper Receives Heyn Prize

Long time Nucleus business manager, Karen Piper, was the 2012 recipient of the Arno Heyn Memorial Book Prize. The prize is awarded annually to a person who has made substantial contributions to the publications of the Northeastern Section of the American Chemical Society. The prize honors the memory of Arno Heyn, editor of the Nucleus from 1986-2003.

Past recipients of the Heyn Award have been Mark Spitler and Sam Kounaves (2005), Vince Gale (2006), Vivian Walworth (2007), Myron Simon (2008), Arthur Obermayer (2009), Donald Rickter (2010) and Harvey Steiner (2011). ♦



Karen Piper (at left) receiving the Arno Heyn Memorial Book Prize from Mary Mahaney, Chair, NESACS Board of Publications.



Karen Piper (second from the left), winner of the 2012 Arno Heyn Memorial Book Prize for contributions to NESACS publications, flanked by (from left) Jim Piper, NESACS Treasurer; Mike Filosa, Editor of *The Nucleus*; Mary Mahaney, Chair, NESACS Board of Publications.

Piper photos continued on page 13

November Meeting

Photos by Morton Z. Hoffman

The November meeting was held at the Astra-Zeneca research facility in Waltham. The meeting highlights were the presentation of the James Flack Norris Award to Vicente Talanquer of the University of Arizona at Tucson and the presentation of the Arno Heyn Memorial Book Prize to Karen Piper, the long time business manager of *The Nucleus*. Many thanks to Ken Mattes and Astra-Zeneca for use of their facility for the meeting. ♦



Vicente Talanquer (on right) receiving the James Flack Norris Award from Jerry Jasinski, Chair, Norris Award Committee.



Vicente Talanquer (University of Arizona), second from left, with (from left) Jerry Jasinski (Keene State College), Chair, Norris Award Committee; Mary Jane Shultz (Tufts University), member of the Norris Award Committee; Ruth Tanner (University of Massachusetts Lowell), NESACS Chair.



Vicente Talanquer (University of Arizona), second from right, with (from left) Doris Lewis (Suffolk University), member of the NESACS Board of Directors; Jerry Jasinski (Keene State College), Chair, Norris Award Committee; Ruth Tanner (University of Massachusetts Lowell), NESACS Chair; Mary Jane Shultz (Tufts University), member of the Norris Award Committee.



Norris Awardees: Vicente Talanquer (University of Arizona), 2012, at left, and Morton Hoffman (Boston University), 2005.



Vicente Talanquer (University of Arizona), at left, with Hannah Sevian (University of Massachusetts Boston).

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The Northeastern Section Celebrates National Chemistry Week's Silver Anniversary

By Christine Jaworek-Lopes

The theme for the 25th anniversary of NCW was Nanotechnology – The Smallest Big Idea in Science. In preparation for National Chemistry Week 2012, a volunteer preparation day was held at Museum of Science-Boston (MoS-Boston) on Sunday, September 30, 2012. More than 30 volunteers attended this event and had the opportunity to practice the hands-on activities and demonstrations related to nanotechnology in advance of the October celebration. Activities included making gummy capsules, learning about the color of butterfly wings, testing fabrics and sand for hydrophobicity, and exploring the science of sunscreens.



National Chemistry Week participants at the Museum of Science - Boston engulfed by a giant model of a carbon nanotube.

On Saturday, October 27, 2012, the Northeastern Section of the American Chemical Society (NESACS) sponsored a National Chemistry Week at the Boston Children's Museum (BCM). Approximately 600 of the 1000+ visitors to the BCM participated in the hands-on activities. On Sunday,

October 28, 2012, a second NCW event was held at the MoS-Boston. Even though Hurricane Sandy was approaching, more than 400 individuals participated in the hands-on activities and demonstrations held in the well of the museum that afternoon. A particular favorite for visitors was building a life-sized carbon nanotube from balloons. A photograph of this giant tube was featured in the December 17, 2012 issue of *Chemical & Engineering News*. Among the highlights of the day were the two Phyllis A. Brauner Memorial Lectures, presented by David Sittenfeld, a 2011 Salute to Excellence Award recipient. David filled in for Dr. Bassam Shkhashiri, ACS President and Professor of Chemistry at the University of Wisconsin-Madison. These captivating lectures were enjoyed by approximately 200 individuals.

The High School Science Series, originally scheduled for Tuesday, October 30, 2012 was postponed and rescheduled as numerous schools remained closed in the aftermath of the hurricane. Approximately 200 students attended the rescheduled High School Science Series event at the MoS-Boston on November 20, 2012. These students participated in a number of hands-on activities and demonstrations related to the yearly theme and heard lecture demonstrations given by David Sittenfeld and Karine Thate. Students from Fenway High School served as facilitators for a number of the hands-on activities.

Special thanks to the Boston Children's Museum, Alissa Daniels, Emily Flaherty, Lucy Green, Sharon Horri-gan, Museum of Science-Boston, Northeastern Section of the American Chemical Society, David Sittenfeld, Dr. Bassam Shkhashiri, Karine Thate, and the Phyllis A. Brauner Memorial Lecture Committee.



David Sittenfeld of the Museum of Science Boston doing his best impersonation of Bassam Shkhashiri presenting his annual chemical magic show. Photo by Doris Lewis

The events would not have been possible without the help of the volunteers listed below: Individuals participated from the following organizations: Alfa Aesar, Beyond Benign, Boston University, Emmanuel College, Global Prior Art, Gordon College, Massachusetts Institute of Technology, Merck-Boston, Nantero, Inc., NESACS, Northeastern University, Salem State, Soane Labs, Stonehill College, Suffolk University, Tufts University, University of Massachusetts-Boston and Weymouth High School.

Thank you NCW volunteers!*

Araceli Acevedo, Daniel Adam, Roden Agalliu, Rekha Agarwalla, Rachael Albury, Lee Andrews, Faraz Arastu, Lucas Armstrong, Hung Anh, Katelyn Barry, Scott Berk, Omar Biyari, Pieter Bos, Jonathan Boyce, Joel Boyd, Susan Brauner, Chris Burkard, Hillary Butts, Michaeline Chen, Kim Clapp, Abbey Clarkin, Gabby Cole, Katie Dapsis, Mary Catherine Dunne, Kelsey Enright, Mollie Enright, Manuel Esquivel, Sarah Faulkner, Davinia Fernandez, Jonathan Flores, Aisling Fox, Briana Fuertes, Lauren Gagnon, Krystal Gmyrek, Alicia Goodridge, Raven Gomberg,

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Summer Scholar

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and available for catalysis. The difference in catalytic activity between as-synthesized particles and cleaned particles can be seen in blank cyclic voltammetry (CV) scans of the particles in sulfuric acid (Figure 2). The peaks for hydrogen adsorption and desorption at -0.3V and -0.2V are much stronger for the cleaned sample, and the peak at 1V corresponding to the oxidation of surface adsorbates is present in the as-synthesized sample but absent in the cleaned sample, demonstrating the absence of adsorbates in the cleaned sample.

Carbon monoxide oxidation or “CO stripping” occurs when a monolayer of CO adsorbed on the surface of a catalyst is oxidized to CO_2 . This reaction tends to be more active – that is, require less voltage input – on more open surfaces with undercoordinated metal atoms. Thus the {100} crystal facet enclosing cubic particles is expected to be more active for CO stripping than the closer-packed {111} facet that encloses octahedral particles, which was shown to be the case for Rh in addition to many other noble metals.⁵ In our study, we tested both cubic and octahedral Pd@Rh particles and found that the cubic particles exhibit a CO-stripping peak at a lower voltage than the octahedral particles. These voltammograms are shown in Figure 3a. The CO-stripping experiment therefore confirms that the synthesized Pd@Rh cubic particles are enclosed in {100} crystal facets and the Pd@Rh octahedral particles are enclosed in {111} crystal facets, which confirms the epitaxy of the Rh overgrowth as shown by other characterization methods.

Formic acid oxidation was also tested on both cubic and octahedral Pd@Rh, shown in Figure 3b. Formic acid can be oxidized by either a direct pathway, which occurs on Pd,⁶ or an indirect pathway through a CO-poisoning intermediate, which occurs on Rh.⁷ Our synthesized particles give a two-peak voltammogram characteristic of an indirect oxidation pathway, demonstrating that the particles are in fact enclosed by Rh rather than Pd. In addition, the current den-

sity (normalized by electrochemically active surface area) for the cubic particles is approximately twice the current density for the octahedral particles, showing that the cubic particles have a higher intrinsic activity for formic acid oxidation than the octahedral particles. This again indicates that the cubic particles have the more open {100} crystal facet while the octahedrons are enclosed by the {111} facet.

In conclusion, we have developed a facile aqueous synthesis for shape-controlled pure Pd and Pd@Rh core-shell nanostructures with epitaxial Rh overgrowth. The particles were used as electrocatalysts for CO stripping and formic acid oxidation and exhibited unique catalytic activities.

Experimental

Details of the experimental procedures used in this work can be found in our JACS paper.²

Acknowledgements

I would like to thank Brian T. Sneed and Chun-Hong Kuo for their work on this project. Thanks to Boston College and the Northeastern Section of the American Chemical Society for their funding.

References

- (1) Cheong, S., Watt, J. D., Tilley, R. D. Shape control of platinum and palladium nanoparticles for catalysis. *Nanoscale*. **2010**, 2, 2045-2053.
- (2) Sneed, B. T., Kuo, C. -H., Brodsky, C. N. Tsung, C. -K. Iodide-mediated control of rhodium epitaxial growth on well-defined noble metal nanocrystals: synthesis, characterization, and structure-dependent catalytic properties. *Journal of the American Chemical Society*. **2012**, DOI: 10.1021/ja308030h
- (3) Kuo, C. -H., Tang, Y., Chou, L. -Y., Sneed, B. T. Brodsky, C. N., Zhao, Z., Tsung, C. -K. Yolk-Shell nanocrystal@ZIF-8 nanostructures for gas-phase heterogeneous catalysis with selectivity control. *Journal of the American Chemical Society*. **2012**, 134 (35), 14345-14348.
- (4) Kuo, C.-H., Hua, T.-E., Huang, M. H. Au nanocrystal-directed growth of Au-Cu₂O core-shell heterostructures with precise morphological control. *Journal of the Amer-*

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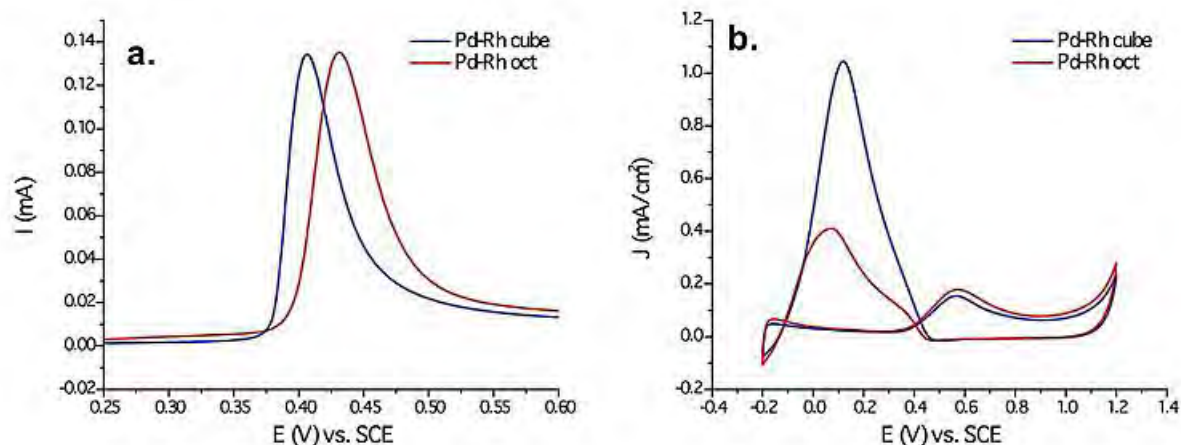


Figure 3: Cyclic voltammetry (CV) of Pd@Rh particles as catalysts for (a) CO stripping and (b) formic acid oxidation.

NCW Anniversary

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Rebecca Harris, Marie Herring, Charlie Hoyt, Sarah Iacobucci, Jamie Joyce, Gina Kim, Neil Lajkiewicz, Aren Lemeris, May Le, Doris Lewis, Yan Lin, Jackie Love, Katie Lovett, Michael Lynch, Jennifer Maclachlan, Gianna Mancuso, Justin Mark, Teresa Marx, Anastasia Maydanov, Sarah McCarron, Joseph McGuire, Kathleen Miller, Todd Miller, Blerta Milo, Alyssa Moccia, Cortland Naegelin, Daniel Neuman, Long Nguyen, Primrose Nimnarle, Moses Njogu, Jason Nogueira, Jackie O'Neil, Carina Paz, John Podobinski, Melissa Podolsky, Melissa Porto, Hayley Power, Dominik Rabej, Jayashree Ranga, Elena Roffel, Rozana Saklou, Jen Scherer, Andrea Schneider, Laura Schneider, Bryan Sears, Phieng Siliphaivanh, Sarah Spiegel, Ben Stewart, Stacey Strobel, Sydney Strong, Sophia Su, Kyle Swerdlow, Kelly Tan, Parch Tivitmahaisoon, Jacqueline Toomey, Justin Troisi, Lauren Tulley, Maura Tuohy, Samantha Watson, Owen Williams, Pearl Yip, Larissa Zablowski, Greg Zhang

***I apologize if your name is not on this list.**

The 2013 theme for NCW is Energy: Now and Forever. ◇

Summer Scholar

continued from page 10

- ican Chemical Society*. **2009**, 131, 17871.
- (5) Xu, Q.; Linke, U.; Bujak, R.; Wandlowski, T. Preparation and electrochemical characterization of low-index rhodium single crystal electrodes in sulfuric acid. *Electrochimica Acta*. **2009**, 54, 5509.
- (6) Rice, C.; Ha, S.; Masel, R. I.; Wieckowski, A. Catalysts for direct formic acid fuel cells. *Journal of Power Sources* **2003**, 115, 229.
- (7) Adić, R. R.; Tripković, A. V. J. Optical and electrochemical study of electrocatalysis by foreign metal adatoms – oxidation of formic acid on rhodium. *Journal of Electroanalytical Chemistry*. **1979**, 99, 43. ◇

Biography

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the Professional Advancement of Black Chemists and Chemical Engineers and the Association for Women in Science and the American Association for the Advancement of Science.

She was the 2004 Société de Chimie Industrielle (American Section) Fellow of the Chemical Heritage Foundation. She has studied the History of African-American women chemists and is currently lecturing about her work. In 2009 she received the Ulliyott Fellowship from the Chemical Heritage Foundation to work on her book about African American Women Chemists. In December 2011 this book was published by Oxford University Press. She is currently lecturing about how to use the book to teach the history of chemistry and the history of women in science.

Her awards include the ACS Women Chemists Committee Regional Award for Contributions to Diversity 2002. She is listed in Who's Who in America 2004 Vol. I. P 630. Her biography is profiled in "African American National Biography" Volume I P.617. She is also listed in the current issue of "Who's Who in Science." She is the 2005 recipient of the American Chemical Society Dreyfus Award for mentoring minorities in science. She received an Outstanding Alumni Achievement Award from the University of Minnesota in 2005. She also received an Alumni Award from the Hunter College Chemistry Department and the North Jersey ACS Harvey Russell Award for service to High school teachers. She is a 2007 AWIS Fellow. She is a member of the first class of American Chemical Society Fellows 2009, the only African-American woman elected in the first class of fellows. She received the Somerset County New Jersey Women's Commission award for volunteerism 2010. ◇



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Task Force Vision

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- An international employment initiative which is planned for New Orleans.
 - Undergraduate and graduate level curricula with content in technology transfer, entrepreneurial, business and legal aspects are under discussion.
- This supports and extends Bassam's and the Committee on Professional Training's initiatives.
- Provide resources to support mid-career members to pursue their career objectives.
 - Create an information dialog on non-traditional career paths, patent matters and advocacy for members to be informed to make personal decisions.

NESACS members on the task force were Sonja Strah-Playnet, Mukund Chorghade and Daniel Eustace. ◇

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Arno Heyn

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*Arno Heyn,
University of Michigan, 1940*

each May. Although he never thought highly of his piano talent, he was proficient enough to pass the necessary requirement for choir membership. Over his lifetime Arno acquired an extensive collection of recordings, sharing his love of classical music with his family.

During his doctoral work, he became friends with Vivian Kann, a student also doing work with Hobart Willard. Arno writes:

“Vivian was engaged to Wilbur Walworth in spring of 1941. As she was picking up the printed wedding announcements in town one day, I bumped into her, with a tall skinny girl, Helen Pielemeier, who had graduated that spring and was now running the small library in the School of Public Health. I didn’t pay too much attention to this girl who was about 4” taller than I.

That fall, since Helen and Vivian lived on the same side of town, Helen would come over to the chemistry lab after work, and I would give them both a ride home. I would let off Helen first, and then took Vivian home, and often Vivian and I would stand outside and talk for many minutes before I finally drove back to my home. After a while, however, I’d take Vivian home first, and Helen second, and we would sit in the car and talk. As things went along, we started dating.”

In December, they were engaged and on March 14, 1942 married in Bethel Church, Ann Arbor.

“In the early forties, all young men were subject to the draft for military service. Being a graduate student in an “essential” line of study (chemistry), I had been deferred, pending completion of my graduate work. But in late September 1944, I received an induction notice. At the New York ACS Meeting in August 1944, I had been interviewed by people from Sun Oil, whose work had enough priority so they were pretty sure to be able to get me deferred. So, right after I got the induction notice, I wired Sun Oil, and they wired back early on Oct. 4 that they could arrange to get me deferred if I could be in Philadelphia the next morning.

I quickly packed a bag and got onto the Red Arrow train which ran from Chicago through Ann Arbor to Philadelphia and got space in the Pullman sleeper, and was in Philadelphia the next morning.”

“By 1946, after the war had ended, I no longer needed to be in industry since I was no longer subject to be drafted, and I was looking around for a teaching job. Dr. Willard had heard of an opening at Boston University. I had never heard of Boston University. I did know that Boston College, a Catholic college, was well known for its football team, but who in the Midwest had ever heard of Boston University?

Sure, we knew that Harvard and MIT were in Cambridge, across the river, but other than having heard about Mayor Curley, we knew nothing of Boston. I recall my father saying that once, while in Boston, he had taken a cab and found the streets so complicated and intertwined that he couldn’t see how the cabby could find his way.”

“I took the train to Boston to be interviewed and apparently satisfied the faculty members I had talked with and in due time was offered a job as Instructor with the royal annual salary of \$3,000 plus pay for the summer.”

Helen found a house in Newton for \$16,000, where they both spent the

rest of their lives and raised their three children: Evan born in 1947, Margaret born in 1949 & Robert born in 1954.



*Arno and Helen
with Evan, Margaret and Robert in 1959*

At B.U. Arno advanced from Instructor to Assistant Professor, and later, to Associate Professor with tenure, and again a few years later to Full Professor. He taught analytical chemistry and environmental chemistry at BU. He was more interested in teaching than in research, but did have a few doctoral students, most notably Martha Bergin and Phyllis Brauner. He spent three sabbatical leaves in Europe, the first in 1965 at the Eidgen. Hochschule, Zürich, the second in 1973 split between the Waterchemistry Lab at the Kernforschungszentrum Karlsruhe (Germany) and a Water quality state lab in Vienna, the third in 1980 again in Karlsruhe. He returned for three summer stays to the lab in Karlsruhe in following years, and thereafter returned to Europe every 2-3 years for visits with his two German cousins and to renew his acquaintance with former schoolmates at the Fletcher Schule.

Morton Hoffman recalls lunch-times in Arno’s office: “Lunchtime featured Arno’s cookie box, which was always filled with goodies that I could not resist, and his Constant Comment loose tea, which he steeped from a spoon-like device into a cup with boiling water. How he would carefully measure out the tea: too little and the tea would be insipid, too much and it would be acerbic.”

“Arno was, after all, a card-carry-

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Arno Heyn

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ing analytical chemist; he was part of that tradition where the proper application of quantitative volumetric and gravimetric techniques was the difference between being a chemist and something else. He prided himself on the time he spent with students in the quantitative analysis and instrumental analysis laboratories, answering the questions and showing them the proper use of the pipette, burette, and rubber policeman. He relished the quest for the perfect measurement while knowing full well the limits to precision. Precision of speech, writing, and attitude characterized Arno's professional and personal life."

"Within the Chemistry Department, Arno was the institutional memory. He not only took the minutes at faculty meetings, he remembered for years (or, perhaps, decades) this or that action of the past and all the debating points, and would not hesitate to let the historical strength or weakness of one's position be known. It was not possible to beat Arno in the memory game."

In his childhood, Arno spent summers at his grandmother's country guest house, nestled in the mountains of Germany. His love for nature and hiking the great outdoors was a lifelong passion, which he taught his children, along with his knowledge of wildlife and camping.

In 1951, Arno discovered the Sub Sig Outing Club, joining them on hiking and ski trips, first with their unique bus which could sleep 22 people and had a small kitchen. Later a sister group bought a closed village school in Moretown, VT which was converted to a simple ski dorm, and in 1966 Sub Sig acquired land in Harts Location north of Bartlett, NH and built a cabin for 20 people.

Arno was a key helper in these enterprises, doing all of the electric wiring, all the propane gas plumbing and contributing to the carpentry and masonry construction of the entire cabin and out-house. In 1999, when the original cabin was destroyed by light-

ning, Arno gladly and generously duplicated all of his labors again to rebuild a new cabin. In 1985, Sub Sig conferred the title of Life Member to Arno, "in grateful appreciation for loyal commitment, significant leadership and outstanding contributions."

His hiking friends remember him best for his careful planning and exceptionally positive attitude. Vivian Walworth tells of one hike in the early years characterized by an unusual series of unfortunate events which left their group of lost campers forced to sleep in the forest without any appropriate gear. Arno was the only member who remained cheerful and positive, pointing out how much they had all learned in just one weekend!

It was just such unrelenting and genuine cheerfulness combined with respectful, considerate and generous actions that endeared Arno to all who knew him.

Arno always enjoyed working with his hands, and often did mechanical and household repairs with his sons. Looking ahead to retirement, Arno earned a diploma in 1969 from the Locksmithing Institute of Little Falls, N.J. Upon retiring, Arno launched a successful business, marketing to new home owners in the Western Suburbs of Boston.

His small stature and smiling disposition accurately portrayed his sterling integrity to his customers. Although he continued to enjoy traveling, photography, music, cooking, as well as his locksmithing work, his first priority in retirement was always *The Nucleus*. His family knew all else would stop, until the next edition was complete. It was his tireless dedication and enthusiasm for the Northeastern Section that led the chapter to establish this award in his honor.

Sources:

Arno Heyn's Memoir
The Nucleus, February 2005, pg6-8. ◇

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Arno Heyn Award

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(L-R) Janice Meisenhelder-Heyn, 2012 Awardee, Karen Piper, and Robert Heyn.

Photo by Morton Z. Hoffman

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<http://www.unh.edu/chemistry/events>

Feb 04

Prof. Thomas Hoye (University of Minnesota)
Harvard, Pfizer Lecture Hall, 4:15 pm

Daniel Kahne (Harvard)

“Lipopolysaccharide transport and assembly in *Escherichia coli*”

Brandeis, Gerstenzang 121, 4:00 p.m.

Feb 07

Dr. William A. Eaton (National Institutes of Health)

Harvard-MIT Physical Chemistry Seminar
Harvard, Pfizer Lecture Hall, 5:00 pm

Prof. Colin Nuckolls (Columbia University)
MIT, 6-120, 4:00 pm

Feb 11

Frank H. Westheimer Prize Lecture

Prof. Ronald Breslow (Columbia)
Harvard, Pfizer Lecture Hall, 4:15 pm

Carlos Barbas (The Scripps Research Institute)

“From Enamines to Vaccines: Enzymes, Organocatalysis, and New Therapeutic Approaches”

Brandeis, Gerstenzang 121, 4:00 p.m.

Feb 12

Prof. Klaus Schmidt-Rohr (Iowa State University)

“NMR and SAXS Analysis of Complex Materials: Nanodiamond, Bone, and the Nafion Fuel-Cell Membrane”

MIT, 6-120, 4:30 pm

Prof. Samuel Thomas (Tufts University)
UNH, Room N104, 11:10 am

Feb 14

Prof. Niek van Hulst (Institute of Photonic Sciences)

Harvard, Pfizer Lecture Hall, 4:15 pm

Prof. William Dichtel (Cornell University)
MIT, 6-120, 4:00 pm

Dr. Sarah Larsen (University of Iowa)
UNH, Room N104, 11:10 am

Feb 20

Prof. Terrence Collins (Carnegie Mellon University)

MIT, Room TBA, 4:00 pm

Feb 21

Dr. De-En Jiang (Oak Ridge National Laboratory)

“From Benzene to Graphene and Things In Between”

Boston College, Merkert 130, 4:00 pm

Dr. Michael Balogh (Waters Corp.)
UNH, Room N104, 11:10 am

Feb 25

Prof. Hung-Wen Liu (University of Texas)
“Search for a Naturally Selected Diels-Alderase”

Harvard, Pfizer Lecture Hall, 4:15 pm

T.Y. Shen Lectures in Biological Chemistry

Prof. Squire Booker (Penn State)
MIT, 6-120, 4:30 pm

Joe Tien (Boston University)

“Vascularization of microfluidic hydrogels”
Brandeis, Gerstenzang 121, 4:00 p.m.

Feb 26

Prof. Gojko Lalic (University of Washington – Seattle)

Boston College, Merkert 130, 4:00 pm

T.Y. Shen Lectures in Biological Chemistry

Prof. Squire Booker (Penn State)
MIT, 6-120, 4:00 pm

Prof. Olof Ramström (Royal Institute of Technology, Stockholm)

Dynamic Systems for Selection and Asymmetric Transformation Processes

UNH, Room N104, 11:10 am

Feb 27

Prof. Gustavo Scuseria (Rice University)
MIT, Room TBA, 4:00 pm

Harvard-MIT Inorganic Chemistry Seminar

Prof. Terrence Collins (Carnegie Mellon University)

MIT, 6-120, 4:15 pm

Feb 28

Prof. Christoph Boehme (University of Utah)
Harvard, Pfizer Lecture Hall, 4:15 pm

Prof. Corey Stephenson (Boston University)
MIT, 6-120, 4:00 pm

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