

John P. Bullock

Curriculum Vitae (revised 8/2014)

Professional Positions:

Member of the Faculty, Chemistry, Bennington College, Bennington, VT (2002 - present).

Member of the Faculty, The Evergreen State College, Olympia, WA (1999 - 2002).

Assistant Professor of Chemistry, Central Washington University, Ellensburg, WA (1995 - 99).

Postdoctoral Research Associate, University of Washington, Seattle, WA (1994-95)

Senior Research Chemist, Air Products & Chemicals, Inc., Allentown, PA (1990-94)

Education:

Ph.D. in Inorganic Chemistry: University of Minnesota; Minneapolis, Minnesota, 1990. Thesis topic:
Application of Infrared Spectroelectrochemistry to Organometallic Compounds

B. S. in Chemistry: State University of New York College at Plattsburgh; Plattsburgh, NY, 1985.

Courses Taught (Bennington College 2008-present):

Chemistry 1 – 4 sequence with lab (curriculum designed with Janet Foley): ongoing

Biochemistry: Spring 2010, 2013, 2014

Introduction to Nanoscience: Fall 2010

Nanotechnology Group Tutorial: Fall 2011

Foundations of Physical Science (planned with Janet Foley & Tim Schroeder): Fall 2012

5th Term Science & Math Seminar (co-taught with Amie McClellan): Fall 2010, 2013

Challenges & Opportunities of Light (Design lab co-taught with Liz Deschenes and Michael Gianitti)
Fall 2010

Bennington College Committee Work & Service (2008- present)

Faculty Performance Review Committee (2010 – present; Chair 2011 – present)

Faculty Commencement Speaker (2012)

Coordinator, Science & Math Self-Study (Fall 2010 – Fall 2011)

Dean Search Committee (2010)

Professional Publications:

Bullock, J.P.; Bond, A.M.; Boeré, R.T.; Gietz, T.M.; Roemmele, T. L.; Seagrave, S. D.; Masuda, J. D.; Parvez, M. “Synthesis, Characterization, and Electrochemical Studies of $\text{PPh}_{3-n}(\text{dipp})_n$ (dipp =

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2,6-Diisopropylphenyl): Steric and Electronic Effects on the Chemical and Electrochemical Oxidation of a Homologous Series of Triarylphosphines and the Reactivities of the Corresponding Phosphoniumyl Radical Cations” *Journal of the American Chemical Society*, **2013**, *135*, 11205-11215.

Bullock, J. P.; Mashkina, E.; Bond, A. M. “Activation Parameters Derived From a Temperature Dependent Large Amplitude ac Voltammetric Study of the Electrode Kinetics of the $Cp_2M^{0/+}$ Redox Couples (M = Fe, Co) at a Glassy Carbon Electrode” *The Journal of Physical Chemistry A*, **2011**, *115*, 6493-6502.

Lee, C.-Y.; Bullock, J. P.; Kennedy, G. F.; Bond, A. M. “Effects of Coupled Homogeneous Chemical Reactions on the Response of Large-Amplitude AC Voltammetry: Extraction of Kinetic and Mechanistic Information by Fourier Transform Analysis of Higher Harmonic Data” *The Journal of Physical Chemistry A*, **2010** *114*, 10122.

Torriero, A. A. J.; Shiddiky, M. J. A.; Bullock, J. P.; Boas, J. F.; MacFarlane, D. R.; Bond, A. M. “Electrooxidation of $[(\eta^5-C_5H_5)Fe(CO)_2]_2$ As a Probe of the Nucleophilic Properties of Ionic Liquid Anions” *Inorganic Chemistry*, **2010** *49*, 2502.

Carlson, B.; Bullock, J. P.; Hance, T. M.; Phelan, G. D. “Barometric Sensitive Coatings Based upon Osmium Complexes Dissolved in a Fluoroacrylic Polymer” *Analytical Chem.* **2009**, *81*, 262.

Carlson, B.; Eichinger, B. E.; Kaminsky, W.; Bullock, J. P.; Phelan, G. D. “Photophysical Properties, X-Ray Structures, Electrochemistry, and DFT Computational Chemistry of Osmium Complexes” *Inorganic Chimica Acta*, **2009**, *362*, 1611.

Bullock, J. P.; Carter, E.; Johnson, R.; Kennedy, A. T.; Key, S. E.; Kraft, B. J.; Saxon, D.; Underwood, P. “Reactivity of Electrochemically Generated Rhenium (II) Tricarbonyl α -Diimine Complexes: A Reinvestigation of the Oxidation of Luminescent $Re(CO)_3(\alpha\text{-Diimine})Cl$ Compounds and Related Species” *Inorganic Chemistry*, **2008**, *47*, 7880.

Johnson, R.; Madhani, H.; Bullock, J. P. “Electrochemical Oxidation of $Mo(CO)_4(LL)$ and $Mo(CO)_3(LL)(CH_3CN)$: Generation, Infrared Characterization, and Reactivity of $[Mo(CO)_4(LL)]^+$ and $[Mo(CO)_3(LL)(CH_3CN)]^{+}$ ” *Inorg. Chim. Acta*, **2007**, *360*, 3414..

Bullock, J. P.; Baron, A. E.; Gouterman, M. “Non-Equilibrium Errors in Pressure Sensitive Paint Measurements” in *Flow Visualization VII*; Crowder, J. P., ed. Begell House, Inc.: New York, 1995, 795.

Hill, M. G.; Bullock, J. P.; Wilson, T.; Bacon, P.; Blaine, C. A.; Mann, K. R.; “Infrared Spectroelectrochemistry of $[Rh(TM_4)_4M(CO)_5]_2^{2+}$ ($TM_4 = 2,5\text{-diisocyano-2,5-dimethylhexane}$; M = Re, Mn)” *Inorg. Chim. Acta* **1994**, *226*, 61.

Daws, C. A.; Hill, M. G.; Bullock, J. P.; Mann, K. R. “Steric Control in the Synthesis and Stereochemistry of the Asymmetric ‘Head-to-Head’ Isomer of $[Rh_2(\mu\text{-HTP5})_2(\mu\text{-dppm})_2](PF_6)_2$ (HTP5 = 1,5-diisocyano-1,1,5-triphenylpentane; dppm = bis(diphenylphosphino)-methane)” *Inorg. Chem.* **1992**, *31*, 2948.

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Bullock, J. P.; Palazotto, M. C.; Mann, K. R. "Electrochemistry and Infrared Spectroelectrochemistry of $[(\eta^5\text{-C}_5\text{R}_5)\text{Fe}(\text{CO})_2]_2$ (R= H, Me): Generation and Characterization of $[(\eta^5\text{-C}_5\text{R}_5)\text{Fe}(\text{CO})_2]_2(\text{PF}_6)$ Complexes" *Inorg. Chem.* **1991**, *30*, 1284.

Bullock, J. P.; Palazotto, M. C.; Mann, K. R. "Electrochemistry and Infrared Spectroelectrochemistry of $\text{M}_n\text{SnPh}_{4-n}$ (M = CpFe(CO)₂, Mn(CO)₅, CpMo(CO)₃; n = 1, 2)" *Inorg. Chem.* **1990**, *29*, 4413.

Bullock, J. P.; Mann, K. R. "UV-Vis-IR Thin-Layer Spectroelectrochemical Studies of Hexakis(aryl isocyanide)chromium Complexes. In Situ Generation and Characterization of Four Oxidation States" *Inorg. Chem.* **1989**, *28*, 4006.

Bullock, J. P.; Boyd, D. C.; Mann, K. R. "In Situ Infrared Spectroelectrochemistry Studies of Ferrocene, $[\text{Rh}_2(\text{dimen})_2(\text{dppm})_2](\text{PF}_6)_2$, and $(\text{mes})\text{Cr}(\text{CO})_3$ (dimen = 1,8-diisocyanomenthane; dppm = bis(diphenylphosphino)methane; mes = mesitylene). A Useful Technique for the Characterization of Electrochemically Generated Organometallic Species" *Inorg. Chem.* **1987**, *26*, 3084.

Presentations:

Electro-oxidation of $P(\text{Ph})_x(\text{dipp})_{3-x}$ (dipp = 2,6-diisopropylphenyl; x = 0, 1, 2, 3) in non-aqueous media: an investigation into the role of sterics on electrochemical behavior and activation parameters across a homologous series of phosphines. J. P. Bullock, A. M. Bond, R. Boéré, 244th National Meeting of the American Chemical Society, Philadelphia, PA, August 22, 2012.

Effects of coupled homogeneous chemical reactions on the response of large amplitude AC voltammetry: Extraction of kinetic and mechanistic information by Fourier transform analysis of higher harmonic data J. P. Bullock, A. M. Bond, , 37th Northeast Regional Meeting of the American Chemical Society, Potsdam, NY, June 3, 2010.

Electrooxidation of $[(\eta^5\text{-C}_5\text{H}_5)\text{Fe}(\text{CO})_2]_2$ in Ionic Liquids: First Direct Determination of the Nucleophilic Properties of Ionic Liquid Anions J. P. Bullock, A. A. J. Torriero, J. F. Boas, M. J. A. Shiddiky, A. M. Bond, 239th National Meeting of the American Chemical Society, San Francisco, CA, March 25, 2010.

Reactivity of Electrochemically Generated Rhenium (II) Tricarbonyl α -Diimine Complexes: A Reinvestigation of the Oxidation of Luminescent $\text{Re}(\text{CO})_3(\alpha\text{-Diimine})\text{Cl}$ Compounds J. P. Bullock, presentation at Monash University, Clayton, Victoria, Australia, February 24, 2009

Reactivity of Electrogenerated $[\text{W}(\text{CO})_5\text{L}]^+$ (L = pyridine) J. P. Bullock, E. Yenidjeian, R. Smith, 35th Northeast Regional Meeting of the American Chemical Society, Burlington, VT, July 1, 2008.

More Than the Sum of its Parts: An Integrated Approach to General and Organic Chemistry J. P. Bullock, J., Foley, 35th Northeast Regional Meeting of the American Chemical Society, Burlington, VT, June 30, 2008.

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Electrochemical Investigations of $W(CO)_5L$ and $W(CO)_4L_2$ Complexes: Elucidation of the Reaction Pathways of $[W(CO)_5L]^+$ and $[W(CO)_4L_2]^+$. E. Yenidjeian, J. P. Bullock, Vermont EPSCoR Annual Meeting, Burlington, VT, March 28, 2007.

Electrochemical Studies of Luminescent d^0 Carbonyl Compounds J. P. Bullock, Hudson Chemistry Lecture Series, SUNY Plattsburgh, February 9, 2007

Electrochemical Oxidation of $Mo(CO)_3(\alpha\text{-diimine})(CH_3CN)$: Infrared Spectroelectrochemical Studies of the Reactivity of $[Mo(CO)_3(\alpha\text{-diimine})(CH_3CN)]^+$ Complexes. J. P. Bullock, R. Johnson, H. Madhani, 34th Northeast Regional Meeting of the American Chemical Society, Binghamton, NY, October 5, 2006.

Electrochemical Oxidation of $M(CO)_4(bpy)$ and $M(CO)_3(bpy)(CH_3CN)$ Complexes ($M = Mo, W$): Elucidation of the Fate of Electrogenenerated Seventeen-Electron Species. J. P. Bullock, R. Johnson, H. Madhani, 38th Middle Atlantic Regional Meeting of the American Chemical Society, Hershey, PA, June 7, 2006.

From Wind-Tunnels to Chemotherapy – Recent and Future Applications of Luminescent Materials. J. P. Bullock, presentation to The Tuesday Night Supper Club, Bennington College, September 20, 2005.

Synthesis and Characterization of Redox Tunable Luminescent Complexes. R. Johnson, J. P. Bullock, Vermont EPSCoR Annual Meeting, Burlington, VT, August 15, 2005.

The Chemistry of 19th Century Photographic Negative Processes. J. P. Bullock, presented at Nineteenth Century Photographic Negative Process: A Collaborative Workshop in Photograph Conservation, George Eastman House, Rochester, NY, June 15, 2005.

Synthesis and Characterization of Novel Rhenium Tricarbonyl/Pentacyanoiron Complexes, $\{[Re(CO)_3(LL)](\mu\text{-pyCN})[Fe(CN)_5]^{2-}$. R. Johnson, J. P. Bullock, 228th Meeting of the American Chemical Society, Philadelphia, PA, August, 23, 2004.

The Synthesis and Electrochemical Characterization of Luminescent Binuclear Rhenium Tricarbonyl Complexes, $[Re(LL)(CO)_3](\mu\text{-}4,4'\text{-bpy})[Re(LL')(CO)_3]^{2+}$. A. T. Kennedy, D. Saxon and J. P. Bullock. 31st Northeast Regional Meeting of the American Chemical Society, Saratoga Springs, NY, June 18, 2003.

Correlating Calculated π^ Lumo Energies With Observed Luminescent Characteristics Of $Re(CO)_3(LL)Cl$ Compounds,* L. McElroy and J. P. Bullock. Puget Sound Section of the American Chemical Society Symposium for Undergraduate Research, Bellingham, WA, May 6, 2000.

Reactivity of the Electrogenenerated, 17-electron Species, $[Re(CO)_3(bpy)X]^{2+}$ toward Lewis Bases. E. D. Carter and J. P. Bullock. National Conference on Undergraduate Research, Missoula, MT, April 27, 2000.

Laying the Foundation for Artificial Photosynthesis: Electrochemical Investigations of Potential Solar Energy Conversion Catalysts. S. E. Key, E. D. Carter, L. C. Neufeld, D. B. Bolstad, J.C. Earlywine, S. Hatch and J. P. Bullock. Natural Science Seminar Series, Central Washington University, Ellensburg, WA, June 2, 1999.

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Reactivity of the Electrogenerated, 17-electron Species, $[Re(CO)_3(bpy)X]^{2+}$ toward Lewis Bases. S. E. Key, E. D. Carter, L. C. Neufeld, D. B. Bolstad, J.C. Earlywine, S. Hatch and J. P. Bullock. 4th Annual Undergraduate Research Symposium, Central Washington University, Ellensburg, WA, May 15, 1999.

Mechanistic Studies of the Disproportionation of $[Re(CO)_3(LL)Cl]^+$. E. D. Carter, S. E. Key, Jonathan C. Earlywine, L. Neufeld, D. Bolstad and J. P. Bullock. Puget Sound Section of the American Chemical Society Undergraduate Research Symposium, Ellensburg WA, April 17, 1999.

Reactivity of the Electrogenerated, 17-electron Species, $[Re(CO)_3(bpy)X]^{2+}$ toward Lewis Bases. S. E. Key, E. D. Carter, L. C. Neufeld, D. B. Bolstad, J.C. Earlywine, S. Hatch and J. P. Bullock. Puget Sound Section of the American Chemical Society Undergraduate Research Symposium, Ellensburg WA, April 17, 1999.

Animating Quantum Mechanics: Helping Students Visualize Atomic, Hybrid & Molecular Orbitals” J. P. Bullock. Annual Meeting of the Washington College Chemistry Teachers Association, Ellensburg, WA, April 16, 1999.

Reactivity of the Electrogenerated, 17-electron Species $[Re(CO)_3(bpy)X]^{2+}$ towards Lewis Bases. S. E. Key, E. D. Carter, L. C. Neufeld, D. B. Bolstad, J.C. Earlywine, S. Hatch and J. P. Bullock. 217th National Meeting of the American Chemical Society, Anaheim, CA, March 22, 1999.

Oxidation Chemistry of Luminescent Rhenium Tricarbonyl Complexes: Electrochemical Generation and Reactivity of $[Re(CO)_3(LL)Cl]^+$. P. K. Underwood, B. J. Kraft and J. P. Bullock. 53rd Northwest Regional Meeting of the American Chemical Society, Pasco, WA, June 20, 1998.

Electrochemical Investigations of the Oxidation Chemistry of $Re(bpy)(CO)_3Cl$, a Potential Catalyst for Solar Energy Conversion. B. J. Kraft, P. K. Underwood, S. E. Key and J. P. Bullock. 3rd Annual Undergraduate Research Symposium, Central Washington University, Ellensburg, WA, May 16, 1998.

Electrochemical Investigations of the Oxidation Chemistry of $Re(LL)(CO)_3Cl$ B. J. Kraft, P. K. Underwood, S. E. Key and J. P. Bullock. 215th National Meeting of the American Chemical Society, Dallas, TX, March 30, 1998.

Synthesis and Electrochemical Analysis of Novel Co (II) Polypyridine Complexes C. C. Briggs, P. K. Underwood, B. J. Kraft, A. W. Brown and J. P. Bullock. 2nd Annual Undergraduate Research Symposium, Central Washington University, Ellensburg, WA, May 17, 1997

Synthesis, Electrochemistry and Visible Spectroscopy of Novel Cobalt (II) Polypyridine Complexes, $[Co(L_2)_x(L_2')_{3-x}]^{2+}$. C. C. Briggs, W. M. Alguard, A. W. Brown, B. J. Kraft, P. K. Underwood, J. P. Bullock. 213th National Meeting of the American Chemical Society, San Francisco, CA, April 14, 1997.

Non-Equilibrium Errors in Pressure Sensitive Paint Measurements. J. P. Bullock, A. E. Baron and M. Gouterman, M., Seventh International Symposium on Flow Visualization, Seattle, WA, September 7, 1995.

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Development of Novel Pressure-Sensitive Coatings with Low Temperature Dependence Using Ruthenium (II) Complexes. T. Hance, W. B. Carlson, J. P. Bullock and M. Gouterman, Northwest Regional Meeting of the American Chemical Society, Park City UT: June 15, 1995.

Electrochemistry of Novel Cobalt-Based Oxygen Complexes. A. G. Gilicinski, D. Ramprasad, J. P. Bullock and G. P. Pez, Electrochemical Society National Meeting, Honolulu, HA: May 20, 1993.

Polyurethane Recycling. R. M. Machado, J. P. Bullock, B. E. Farrell, F. P. Rudy and K. Lodaya, 16th Annual Air Products Technology Symposium, Trexlertown, PA: December 8, 1992.

Electrochemical and Spectroscopic Studies of d^8 - d^8 Binuclear Complexes of Rh(I). Structural Control of One or Two Electron Oxidations. K. R. Mann, M. G. Hill and J. P. Bullock, 200th ACS National Meeting, Washington, D.C.: August 29, 1990.

Applications of Infrared Spectroelectrochemistry to Organometallic Chemistry. K. R. Mann and J. P. Bullock, Electrochemical Society National Meeting, Montreal, Quebec: May 18, 1990.

Infrared Spectroelectrochemistry of M_nSnPh_{4-n} ($M = CpMo(CO)_3$, $Mn(CO)_5$ and $CpFe(CO)_2$; $n = 1,2$). J. P. Bullock and K. R. Mann, 199th ACS National Meeting, Boston, MA: April 22, 1990.

Electrochemical and Spectroscopic Studies of d^8 - d^8 Binuclear Complexes of Rh(I) and Ir(I). Net One or Two Electron Oxidations. K. R. Mann and J. P. Bullock, Great Lakes Regional ACS Meeting, Chicago, IL: June 25, 1987.

Grants Awarded:

Bullock, J. P. (April 2003) *Electrochemical Modulation of the Luminescent Properties of Polynuclear Transition Metal Complexes*, \$9,081 funded by Vermont EPSCoR (NSF)

Thomas, C; Bullock, J. P.; DeLuca, J.; Duncan, L. C.; Gerdes, J (April 1997) *Renaissance in Chemistry Research at Central Washington University*. \$309,000 funded by the M. J. Murdock Charitable Trust to promote undergraduate research.

Bullock, J. P. (February 1997) *Synthesis of Binuclear, Mixed-Metal Polyimine Complexes* Summer research appointment awarded by the Central Washington University Faculty Research Committee.

Bullock, J. P. (January 1996) *Synthesis of Novel Polynuclear Luminescent Reversible Oxygen-Binding Complexes*. Small Faculty Research Grant awarded by the Central Washington University Faculty Research Committee.