

Patrick John Desrochers

Department of Chemistry
University of Central Arkansas
Conway, Arkansas 72035
Phone: (501) 450-5936 or 450-3152
patrickd@uca.edu

Desrochers main UCA web page: <http://faculty.uca.edu/patrickd/>

Education	<u>University of Arizona</u> Ph.D., Inorganic Chemistry, 1992 “A Re-evaluation of Distortional Isomerism”	<u>California State University, Sacramento</u> B.S., Chemistry, 1987
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Professional Experience	<u>University of Central Arkansas, Department of Chemistry</u> Chair, 2014 - present
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Professor, 2008 - present

Associate Professor, 2001 - 2008 (sabbatical leave Spring 2006)

Assistant Professor, 1992 - 2001 (tenured 1998)

University of Arizona, Department of Chemistry
Graduate research assistant, 1987 - 1992

Technical expertise includes: manipulation and syntheses of air and moisture sensitive compounds; visible, infrared, NMR, EPR, fluorescence, X-ray photoelectron, atomic absorption spectroscopies; X-ray crystallography; magnetic susceptibility, cyclic voltammetry, coulometry, microwave synthesis methods.

Refereed Publications	Desrochers, P. J. “NMR beyond ordinary undergraduate experiences: Routine measurements with heteronuclear, heterogeneous, and paramagnetic samples” In <i>NMR Spectroscopy in the Undergraduate Curriculum</i> ; Soulsby, D. Ed.; ACS Symposium Series; American Chemical Society: Washington, DC, 2013, Ch7. DOI: 10.1021/bk-2013-1128
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UCA
undergraduate
coauthors
underlined.

“Iron(I)-carbonyl clusters tethered to (trifluoromethyl)thiophenolates” Mebi, C.A.; Trujillo, J. J.; Rosenthal, B. L.; Bowman, R. B.; Noll, B. C.; Desrochers, P. J. *Transition Met. Chem.* **2012** 37(7), pp. 645-650. DOI: 10.1007/s11243-012-9633-0

“Electronic Structure of Nickel(II) and Zinc(II) Borohydrides from Spectroscopic Measurements and Computational Modeling” Desrochers, P. J.; Sutton, C. A.; Abrams, M. L.; Ye, S; Neese, F.; Telsler, J.; Ozarowski, A.; Krzystek, J. *Inorganic Chemistry* **2012**, 51, 2793-2805. DOI: 10.1021/ic201775c.

“Immobilized Boron-Centered Heteroscorpionates: Heterocycle Metathesis and

Coordination Chemistry” Desrochers, P. J.; Besel, B. M.; Corken, A. L.; Evanov, J. R.; Hamilton, A. L.; Nutt, D. L.; Tarkka, R. M. *Inorganic Chemistry*, **2011**, *50*, 1931 – 1941. DOI: 10.1021/ic102392x

“A Simple Route to Single-Scorpionate Nickel(II) Complexes with Minimum Steric Requirements” Desrochers, P. J.; Corken, A. L.; Tarkka, R. M.; Besel, B. M.; Mangum, E. E.; Linz, T. N. *Inorganic Chemistry*, **2009**, *48*, 3535-3541. DOI: 10.1021/ic8015645

“Catalytic Dioxygen Activation by (Nitro)(meso-tetrakis(2-N-methylpyridyl)porphyrinato)cobalt(III) Cation Derivatives Electrostatically Immobilized in Nafion Films: An Experimental and DFT Investigation” Goodwin, J. A.; Coor, J. L.; Kavanagh, D. F.; Sabbagh, M.; Howard, J. W.; Adamec, J. R.; Parmley, D. J.; Tarsis, E. M.; Kurtikyan, T. S.; Hovhannisyan, A. A.; Desrochers, P. J.; Standard, J. M. *Inorganic Chemistry*, **2008**, *47*, 7852-7862.

“Nickel-Cysteine Binding Supported by Phosphine Chelates” Desrochers, P. J.; Duong, D.; Marshall, A. S.; Lelievre, S. A.; Hong, B.; Brown, J. R.; Tarkka, R. M. Manion, J. M.; Holman, G.; Merkert, J. W.; Vivic, D. A. *Inorganic Chemistry* **2007**, *46*, 9221-9233. DOI: 10.1021/ic701150q

“Electronic Structure of Four-coordinate, C_{3v} Nickel(II) “Scorpionate” Complexes: Investigation by High-Frequency and -Field Electron Paramagnetic Resonance and Electronic Absorption Spectroscopies” Desrochers, P. J.; Telsler, J.; Zvyagin, S. A.; Ozarowski, A.; Krzystek, J.; Vivic, D. A. *Inorganic Chemistry* **2006**, *45*, 8930-8941.

“Ligand Redox Effects in the Synthesis, Electronic Structure, and Reactivity of an Alkyl-Alkyl Cross-Coupling Catalyst” Jones, G. D.; McFarland, C.; Allen, O. R.; Martin, J. L.; Hall, R. E.; Haley, A. D.; Brandon, R. J.; Kanovalova, T.; Desrochers, P. J.; Pulay, P.; Vivic, D. A. *Journal of the American Chemical Society* **2006**, *128*, 13175-13183.

“Bis[hydrotris(4-chloro-3,5-dimethylpyrazolyl)borato]nickel(II)” Desrochers, P. J.; Brown, J. R.; Arvin, M. E.; Jones, G. D.; Vivic, D. A. *Acta Cryst.* **2005**, *E61*, m1455–m1458.

“A Stable Monomeric Nickel Borohydride” Desrochers, P. J.; LeLievre, S. A.; Johnson, R. J.; Lamb, B. T.; Phelps, A. L.; Cordes, A. W.; Gu, W.; Cramer, S. P. *Inorganic Chemistry* **2003**, *42*, 7945.

“Characteristics of Five-Coordinate Nickel--Cysteine Centers” Desrochers, P. J.; Cutts, R. W.; Rice, P. K.; Golden, M. L.; Graham, J. B.; Barclay, T. M.; Cordes, A. W. *Inorganic*

Chemistry **1999**, vol. 38, pages 5690-5694.

“Studies of Distortional Isomers. 2. Evidence that Green [LWOC₂]PF₆ is a Ternary Mixture.” Desrochers, P. J.; Nebesny, K. W.; LaBarre, M. J.; Bruck, M. A.; Neilson, G. F.; Sperline, R. P.; Enemark, J. H.; Backes, G.; Wieghardt, K. *Inorganic Chemistry* **1994**, vol. 33, pages 15-24.

“Studies of Distortional Isomers: Spectroscopic Evidence that Green *cis,mer*-Dichlorotris(dimethylphenylphosphine)molybdenum(IV) Is a Mixture” Desrochers, P. J.; Nebesny, K. W.; LaBarre, M. J.; Lincoln, S. E.; Loehr, T. M.; Enemark, J. H. *Journal of the American Chemical Society* **1991**, vol. 113, pages 9193-9200.

Awards Council for Advancement and Support of Education Professor of the Year, UCA Nominee, 2003
UCA University-wide Teaching Excellence: 2002 winner, 1997 finalist
UCA University-wide Scholarly and Creative Activity: 2004 winner, 2002 and 2003 finalist
Outstanding Teaching Award, Gamma Beta Phi Honor Society, UCA 1997 finalist

Professional Memberships American Chemical Society
Council on Undergraduate Research, UCA Liaison
Mid-south Inorganic Chemists Association (founding member)

Funded Extramural Proposals “Reactivity, Spectroscopic, and Sensing Properties of Nickel Complexes on Solid Organic Supports,” Co-PI with R. M. Tarkka
Total requested budget = \$ 252,041, National Science Foundation RUI, Aug 2007 – Jul 2012. Award No. CHE 0717213

“Characterization of the Valence Electron Spin Density in Nickel-borohydride Compounds Using HFEPR,” National High Magnetic Field Laboratory, Tallahassee, FL, February 2005 and December 2003. Each session included 40 hours of magnet time on the Keck magnet.

“Bonding and Reactivity of Borohydride and Sulfur Amino Acids on Nickel”
Total budget = \$ 81,000 American Chemical Soc. Petroleum Research Fund, July 2003
Award No. 39644-B3
Also a Supplement for Underrepresented Minority Research Fellowship for Ariel Marshall. March 2006

“Electronic Influence on the Oxidation and Alkylation of a Nickel--Cysteine Center”
Total budget = \$ 46,210 American Chemical Soc. Petroleum Research Fund, 2000 Award No. 35602-B3

“Electron Spin: An Important Experimental Concept”
Total budget = \$ 68,286 National Science Foundation, 1997

“Reactivity of a Monomeric Nickel-Borohydride, the Hydride Bullet”

Total Budget = \$3,900 Arkansas Science Information Liaison Office, 2001

“Electronic Influence on the Alkylation of a Nickel-Cysteine Center”
Total Budget = \$3,900 Arkansas Science Information Liaison Office, 2000

“Reactivity of Five Coordinate Nickel Cysteine Centers”
Total Budget = \$3,670 Arkansas Science Information Liaison Office, 1999

“Synthesis and Reactivity of Discrete Nickel-Cysteine Centers”
Total Budget = \$3,900 Arkansas Science Information Liaison Office, 1998

Presentations

“NMR beyond ordinary undergraduate experiences: Routine measurements with heteronuclear, heterogeneous, and paramagnetic samples” Patrick J. Desrochers, Richard M. Tarkka 241st American Chemical Society National Meeting, Anaheim, CA, March 2011, [CHED 26](#).

“Immobilized boron-centered heteroscorpionates: Heterocycle metathesis and coordination chemistry” Brian M. Besel, Patrick J. Desrochers, Adam L. Corken, Jared R. Evanov, Richard M. Tarkka 241st American Chemical Society National Meeting, Anaheim, CA, March 2011, INOR 332.

“Molybdenum(0) tricarbonyl complexes involving a new heteroscorpionate and resin-supported complexes” Jared R. Evanov, Brian M. Besel, Patrick J. Desrochers, Richard M. Tarkka 241st American Chemical Society National Meeting, Anaheim, CA, March 2011, INOR 334.

“Grabbing Scorpions by the Tail” University of Memphis Department of Chemistry Seminar, February 2011 and 24th Missouri Inorganic Day, MO State, Springfield April 2011.

“Electronic structure of a nickel borohydride from magnetic and spectroscopic measurements and computational models” Patrick J. Desrochers, Joshua Telser, Andrew Ozarowski, Jerzy Krzystek, Micah L. Abrams, Christopher A. Sutton 239th American Chemical Society National Meeting, San Francisco, CA, March 2010, INOR 408.

“Exchange equilibria of variable nitrogen-donors at nickel(II)-scorpionates” Kristin A. Thorvilson, Adeniyi Osinowo, Patrick J. Desrochers 239th American Chemical Society National Meeting, San Francisco, CA, March 2010, INOR 230.

“Direct synthetic routes to unencumbered single-scorpionate nickel complexes” Adam

Corken, Brian M. Besel, Richard Tarkka, Patrick J. Desrochers 237th American Chemical Society National Meeting, Salt Lake City, UT, March 2009, CHED 569.

“Reusable Nickel-Based Materials for Small Scale Ammonia Storage” 5th Annual Ammonia in Fuels Meeting, Minneapolis, MN, October 2008

“An Established Science and Math “Chalk-talk” Student Seminar Series” Council on Undergraduate Research National Meeting, St. Benedict College, St. Joseph, MN, June 2008.

“Frontiers in Nickel Chemistry Involving Phosphorus, Cysteine and Hydrogen” Council on Undergraduate Research National Meeting, St. Benedict College, St. Joseph, MN, June 2008.

“Understanding the stability of metal borohydride compounds” Sutton, C. A.; Abrams, M. L.; Desrochers, P. J. 235th American Chemical Society National Meeting, New Orleans, LA, April 2008, INOR 721.

“Ligated Nickel as a Potential Bio-Sensor and Chemotherapeutic” University of Arkansas, Little Rock, September 2007

“Reversible Ammonia Binding at Nickel: Potential for Sensor Applications” University of Arkansas, Fayetteville, March 2007

“Ammonia Controls Facile Solid-Phase Halide Exchange at Nickel(II)” Sutton, C. A.; Abrams, M. L.; Desrochers, P. J. 233rd American Chemical Society National Meeting, Chicago, IL March 2007: CHED 1178.

“How a five cent investment could catalyze energy independence” Hendrix College, Conway, AR, October 2006

“Reversible surface storage of ammonia” 3rd Annual Ammonia in Fuels Meeting, Golden,

CO, October 2006 (Sponsors: National Renewable Energy Lab. & Iowa Energy Center).

“Reversible ammonia uptake and potential for methane activation at tripodal nickel-nitrogen centers” Desrochers, P. J.; Sutton, C. A. 232nd American Chemical Society National Meeting, San Francisco, CA, September 2006: INOR 15.

“Protonation and reduction of nickel-cysteine centers” Desrochers, P. J.; Marshall, A. S.; Duong, D. 232nd American Chemical Society National Meeting, San Francisco, CA, September 2006: INOR 942.

“Five Cents Worth of Hydrogen and Sulfur Chemistry” University of Mississippi, Oxford, April 2006

“Controlling the Reactivity of Cysteine and Borohydride at Nickel” University of North Carolina, Charlotte, September 2005.

“Selective nickel-cysteine binding on a heterogeneous support” Desrochers, P. J.; Winkler, S. A.; Hong, B.; Brown, J. R.; Tarkka, R. M.; Holman, G.; Richardson, C. B. 229th American Chemical Society National Meeting, San Diego, CA March 2005.

“The Many Faces of Metals” Desrochers, P. J. Public Lecture Series, College of Natural Sciences and Mathematics, University of Central Arkansas, April 2004.

“Nitro Cobalt(III) Tetra(methyl(2)pyridinium)porphyrin Immobilized on Nafion Films and its Oxo-transfer Reactivity” Coor, J.; Goodwin, J.; Parmley, D.; Desrochers, P. J. 55th S. East Regional Meeting of the American Chemical Society, Atlanta GA, November 2003.

“Chalcogen Selectivity by Nickel Controls Coordination Geometries in Model Biochemical Systems” Desrochers, P. J.; Abrams, M.; Nutt, D.; Arvin, M. E.; Phelps, A. L. 20th International Conference on the Organic Chemistry of Sulfur, Northern Arizona University, Flagstaff AZ, July 2002.

“A Successful Program of Informal Undergraduate Research 'Chalk-talk' Seminars” Desrochers, P. J. 223rd American Chemical Society National Meeting, Orlando FL, April 2002: CHED 1140.

“You Lost Me at 'Atoms...! Effective Less-technical Writing by Upper Division Chemistry Majors” Desrochers, P. J. 223rd American Chemical Society National Meeting, Orlando

FL, April 2002: CHED 1096.

“Reactivity of Discrete Nickel Borohydride Complexes” Desrochers, P. J.; Galloway, R. J.; Abrams, M. L. 221st American Chemical Society National Meeting, San Diego CA, April 2001: INOR 664.

“The Reactivity of a Monomeric Nickel-borohydride, the Hydride Bullet” Galloway, R. J.; Phelps, A. L.; Desrochers, P. J. S.East/S.West Regional ACS Meeting, New Orleans LA, Dec 2000.

“Electron Spin: An Important Experimental Concept” Desrochers, P. J. 219th American Chemical Society National Meeting, San Francisco CA, April 2000: CHED 988.

“Interdisciplinary Experiments in Materials Science” Desrochers, P. J.; Ramseyer, T. 219th ACS National Meeting, San Francisco CA, April 2000: CHED 989.

“Overcoming the Kinetic Stability of a Nickel Cysteine Center by Alkylation” Phelps, A. L. and Desrochers, P. J. 219th ACS National Meeting, San Francisco CA, March 2000.

“Application of Nickel-Cysteine Complexes to Hydrogenase Active Sites” Snodgrass, M. L.; Cutts, R. W.; Desrochers, P. J. 53rd S.West Reg. ACS Meeting, Tulsa OK, Oct. 1997: paper 212.

“Facial N₃- and Cysteinyl Thiolate-donor Complexes of Nickel” Desrochers, P. J.; Cutts, R. W.; Rice, P. K. 213th ACS National Meeting, San Francisco CA, April 1997: INOR 820.

“Sulfur-bound Cysteine (ethyl ester) Adducts of Nickel with a Single Trispyrazolylborate Ligand” Cutts, R. W.; Rimmer, D.; Ellis, M. P.; Desrochers, P. J. 210th ACS National Meeting, Chicago IL, August 1995, INOR 488

“Nickel(III) Stabilized by Trispyrazolylborate Ligands” Desrochers, P. J.; Sharp, C. 210th ACS National Meeting, Chicago IL, August 1995, INOR 610.

**Manuscript &
Proposal
Reviews**

Inorganic Chemistry
Journal of Chemical Education
Journal of Inorganic Biochemistry
Polyhedron

National Science Foundation
Research Corporation

**Undergraduate
Research
Highlights**

32 different undergraduates mentored in original nationally competitive research program (7 have subsequently earned Ph.D.'s, 2 M.D.'s)
7 different students earned cash awards for outstanding presentations at regional meetings
Established and organized monthly science and math student research seminar (1996-2012) see <http://faculty.uca.edu/patrickd/chalktalks/signup.htm>
Organized Posters at the Arkansas State Capitol event, Feb. 2012 – present see <http://faculty.uca.edu/wvslaton/ARposters/>
summary video links: [2015 event](#) | [2013 event](#) | [2012 event 1st video](#) | [2102 event 2nd video](#)

**Professional
Community
Outreach**

Chemical demonstrations at local elementary schools, middle school, and county library, since 1993
UCA Junior University chemistry session for 5th grade students (future first generation college students) 2002 - 2006

Statewide and local science fair judge, since 1994
Arkansas Academic Initiative in Math and Science (AIMS) High school chemistry AP
exam prep. sessions 2010 – 12 [Sept 2012 report](#).
Initiated statewide undergraduate research poster session at the Arkansas state capitol in
Little Rock, February 2012
Public science forum panelist: “Chemistry and Ceramics” November 2012, “What is
Color?” September 2014