



Michael J. Rose

Assistant Professor

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Department of Chemistry

Synthetic Inorganic Chemistry & Solar Fuels

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Education and Research

University of Texas, Austin – (2012-present) *Assistant Professor*. Department of Chemistry.

California Institute of Technology – (2009-12) NSF ACC-F Postdoctoral Fellowship (2010-2012); NSF/CCI-Solar Postdoctoral Scholar (2009-2010). Joint appointment in the research groups of Prof Harry Gray and Prof Nate Lewis. Syntheses of Fe, Ni and Co catalysts for H₂ generation and covalent Si-C/C-C attachment of transition metal complexes to silicon photoelectrodes.

University of California, Santa Cruz – Ph.D. Chemistry (2009). Bio-inorganic chemistry, Advisor: Prof Pradip Mascharak. *a)* Syntheses, structures, and biological utility of ruthenium-based NO donors derived from carboxamide ligands and coordinated chromophores. *b)* Synthetic modeling of iron-containing nitrile hydratase: photoregulation of carboxamide/thiolate Fe-active site by NO & effect of S-oxygenation on NO photolability.

Roche Pharmaceuticals (Palo Alto), Inflammatory and Viral Disease Unit (2000-2002) – Research Associate I (2000-2001) / Research Associate II (2001-2002). Drug discovery with purinergic (P₂Y₂/P₂Y₁) and muscarinic (M₁-M₅) G-protein coupled receptors: steady-state and kinetic inhibitors. Development of tissue culture assays for inflammatory mucin production (muc4/5/5ac). Mentor: Dave Swinney, Ph.D.

University of California, Davis – B.S. Fermentation Science (2000). This major incorporates basic and applied chemistry (analytical, organic and biochemistry) in biotechnology and food sciences.

Awards and Fellowships

Ed Stiefel Lecture, Metals in Biology Gordon Conference, January 2017

Cottrell Scholar (\$100K: 2016: Heavy Atom Ligation & Undergraduate Outreach Corps)

Teaching Excellence Award, College of Natural Sciences (2015: Teaching & Promoting Undergraduate Research)

Office of Naval Research, Young Investigator (~\$650K: 2013-2017: Hybrid Molecular/Materials Semiconductors)

Ralph Powe Junior Faculty Enhancement Award (\$5K: 2013-2014: Synthetic Modeling of Mono-Iron Hydrogenase)

NSF ACC-F Postdoctoral Fellowship (\$200K: 2010-2012: Attachment of Molecular H₂ Catalysts to Semiconductors)

NSF/CCI-Solar Postdoctoral Fellowship (\$50K: 2009-2010: A Molecular All-Manganese Water-Splitting Cell)

Chancellor's Dissertation Fellowship (~\$25K: 2007-2008) UCSC, Thesis research support

Other Funding

\$100K: ACS Petroleum Research Foundation (2013-2016): Heavy Atom Ligation

\$180K: Robert A. Welch Foundation (2013-2016): Heavy Atom Ligation

\$20K: Dreyfus Foundation Special Programs (2014-2018): H₂fromH₂O, Water-Splitting Outreach Program

\$25K: Lam Research Corporation (2015-present): Electroless Metal Deposition on Semiconductor Substrates

\$240K: Welch Foundation (2016-2019): Earth Abundant Elements for Energy-Related Transformations

Memberships

American Chemical Society (ACS): Inorganic Division (2003-present)

American Association for Advancement of Science (AAAS), (2005-present)

Publications

[Independent Career – In Revisions or Submitted]

- 1) S. Kuppaswamy, J. Wofford, C. Joseph, A. K. Ali, V. M. Lynch, P. A. Lindahl, and M. J. Rose. Structures, Interconversions and Spectroscopy of Carbonyl Clusters with an Interstitial Carbide: Localized Iron Center Reduction via Cluster Oxidation. *Submitted*.
- 2) Y. Cho, M. Ward and M. J. Rose. Ligand Effects on the Formation of Fluoride-Bridged Dicobalt Complexes via B–F Abstraction: Structures and Magnetism. *In Revisions*.
- 3) J. Seo, T. A. Manes and M. J. Rose. Structural & Functional Synthetic Model of Mono-Iron Hydrogenase (HMD) using an Anthracene Scaffold. *In Revisions*.
- 4) H. J. Kim, K. L. Kearney, L. H. Le, A. A. Rockett and M. J. Rose. Ultra-Thin Film Amorphous and Crystalline TiO₂ on *n*-Si(111) Photoelectrodes: Effect of Thickness and Platinum on Electron Transfer with a Non-Aqueous Redox Couple. *Submitted*.

[Independent Career - Published]

- 5) T. A. Manes and M. J. Rose. Mono- and Dinuclear Manganese Carbonyls Supported by Novel 1,8-Disubstituted (L = Py, S^{Me}, SH) Anthracene Ligand Scaffolds. *Inorg. Chem.* **2016**, *55*, 5127-5138.
- 6) O. M. Williams, J. Shi and M. J. Rose. Photoelectrochemical Study of *p*-GaP(100)|ZnO|Au-NP Devices: Electron Transfer to Non-Aqueous Redox Couples and Substrate Reduction in Aqueous Electrolyte. *Chem. Commun.* **2016**, Accepted.
- 7) L. Taylor, U. Soto, V. M. Lynch and M. J. Rose. Antimony-Supported Cu₄I₄ Cuboid with Short Cu–Cu Bonds: Structural Basis for Far-Visible/NIR Thermoluminescence. *Inorg. Chem.* **2016**, *55*, 3206-32087.
- 8) D. R. Redman, H. J. Kim, K. J. Stevenson and M. J. Rose. Photo-Assisted Electrodeposition of MoS_x from Ionic Liquid on Organic-Functionalized Silicon Photoelectrodes for H₂ Generation. *J Mater. Chem. A* **2016**, 7027-7035.
- 9) G. Durgaprasad, Z.-L. Xie and M. J. Rose. Iron-Hydride Detection and Intramolecular Hydride Transfer in a Synthetic Model of Mono-Iron Hydrogenase with a CNS Chelate. *Inorg. Chem.* **2016**, *55*, 386-389.
- 10) H. J. Kim, J. Seo and M. J. Rose. H₂ Photogeneration Using a Phosphonate-Anchored Ni-PNP Catalyst on a Band-Edge-Modified *p*-Si(111)|AZO Construct. *ACS Appl. Mater. Interfaces* **2016**, *8*, 1061-1066.
- 11) T. A. Manes and M. J. Rose. A Bis-pyridine Rhenium Carbonyl Derived from an Anthracene Scaffold: Redox Properties and its Electrocatalytic CO₂→CO Reduction Activity. *Inorg. Chem. Commun* **2015**, *61*, 221-224.
- 12) F. Li, V. M. Basile and M. J. Rose. Electron Transfer through Surface-Grown, Ferrocene-Capped Oligophenylene Molecular Wires (5–50 Å) on *n*-Si(111) Photoelectrodes. *Langmuir*, **2015**, *31*, 7712-7716.
- 13) J. Seo, R. T. Pekarek and M. J. Rose. Photoelectrochemical Operation of a Surface-Bound, Nickel Phosphine H₂ Catalyst on Si(111): A Molecular Semiconductor|Catalyst Construct. *Chem. Commun.* **2015**, *51*, 13264.
- 14) O. M. Williams, A. H. Cowley and M. J. Rose. Structural and Electronic Characterization of Multi-Electron Reduced Naphthalene(BIAN)-Cobaloximes. *Dalton. Trans.* **2015**, *44*, 13017-13029.
- 15) H. J. Kim, K. L. Kearney, L. Le, R. Pekarek and M. J. Rose. Platinum-Enhanced Electron Transfer on Si(111)-CH₃ Photoelectrodes Protected with Thin Film Aluminum Oxide (Al₂O₃). *ACS Appl. Mater. Intfc.* **2015**, *7*, 8572-8584.
- 16) J. Seo, H. J. Kim, R. T. Pekarek and M. J. Rose. Hybrid Organic/Inorganic Band-Edge Modulation of *p*-Si(111) Photoelectrodes: Effects of R, Metal Oxide and Pt on H₂ Generation. *J. Am. Chem. Soc.* **2015**, *137*, 3173-3177.
- 17) K. A. Thomas Muthia, G. Durgaprasad, C. Joseph, V. M. Lynch and M. J. Rose. Synthesis & Stabilities of Mononuclear Iron(II) Dicarbonyls derived from Neutral NNS Ligands. *Eur. J. Inorg. Chem.* **2015**, 1675-1691.
- 18) F. Li, V. Basile, R. Pekarek and M. J. Rose. Steric Spacing of Molecular Linkers on Passivated Si(111) Photoelectrodes. *ACS Appl. Mater. Interfaces* **2014**, *6*, 20557-20568.
- 19) J. Seo, A. Ali and M. J. Rose. Novel Ligand Architectures for Metalloenzyme Modeling: Anthracene-based Ligands for Synthetic Modeling of Mono-[Fe] Hydrogenase. *Comments Inorg. Chem.* **2014**, *34*, 103-113.

- 20) S. E. A. Lumsden, G. Durgaprasad, K. A. Thomas Mutiah and M. J. Rose. Tuning Coordination Modes of Pyridine/Thioether Schiff Base (NNS) Ligands to Mononuclear Manganese Carbonyls. *Dalton Trans.* **2014**, 43, 10725.
- 21) Y. I. Cho, D. M. Joseph and M. J. Rose. 'Criss-Crossed' Dinucleating Behavior of an N₄ Schiff Base Ligand: Formation of a μ -OH, μ -O₂ Dicobalt(III) Core via O₂ Activation. *Inorg. Chem.* **2013**, 52, 13298.

[Postdoctoral]

- 22) J. R. McKone, S. Ardo, J. D. Blakemore, P. J. Bracher, J. L. Dempsey, T. V. Darnton, M. C. Hansen, W. H. Harman, M. J. Rose, M. G. Walter, S. Dasgupta, J. R. Winkler, and H. B. Gray. The Solar Army: A Case Study in Outreach Based on Solar Photoelectrochemistry. *Rev. Adv. Sci. Eng.* **2014**, 3, 288-303.
- 23) L. E. O'Leary, M. J. Rose, T. X. Ding, E. Johansson, B. S. Brunshwig and N. S. Lewis. Heck Couplings of Small Molecules to Mixed Methyl/Thienyl Monolayers at Low Defect Density Si(111). *J. Am. Chem. Soc.* **2013**, 135, 10081.
- 24) M. J. Rose, J. R. Winkler and H. B. Gray. Hydrogen Generation Catalyzed by Fluorinated Diglyoxime-Iron Complexes at Low Overpotentials. *J. Am. Chem. Soc.* **2012**, 134, 8310.
- 25) M. J. Rose, J. R. Winkler and H. B. Gray. Four-Iron Cluster and a Buckled Macrocyclic Complex from Reduction of [(dmgBF₂)Fe(L)₂] (L = MeCN, ^tBu⁺NC). *Inorg. Chem.* **2012**, 51, 1980.
- 26) M. J. Rose, D. E. Bellone and H. B. Gray. Spectroscopic and Magnetic Characterization of an Iodo Co(I) Tripodal Phosphine Complex. *Dalton Trans.* **2012**, 41, 11788.
- 27) Q. Dong, M. J. Rose, W.-Y. Wong and H. B. Gray. Dual Coordination Modes of Ethylene Linked NP₂ Ligands with Cobalt(II) and Nickel(II) Iodides. *Inorg. Chem.* **2011**, 50, 10213.

[Graduate]

- 28) M. J. Rose, N. M. Betterley, A. Oliver, and P. K. Mascharak. Binding and Photorelease of Nitric Oxide (NO) to a Synthetic Model of Iron-Containing Nitrile Hydratase (Fe-NHase). *Inorg. Chem.* **2010**, 49, 1854-1864.
- 29) M. J. Rose, A. K. Patra, M. M. Olmstead and P. K. Mascharak. Structural and Spectroscopic Evidence for Linkage Isomerism of Bound Nitrite in a {Fe-NO}⁶ Nitrosyl derived from a Tetradentate Dicarboxamide Ligand: More Parallels between Heme and Non-heme Systems. *Inorg. Chim. Acta* **2010**, 363, 2715.
- 30) N. Fry, M. J. Rose, David L. Rogow, C. Nyitray, Manpreet Kaur and P. K. Mascharak. Ruthenium Nitrosyls Derived from Tetradentate Ligands containing Carboxamido-N and Phenolato-O Donors: Syntheses, Structures, Photolability and Time-Dependent Density Functional Studies. *Inorg. Chem.* **2010**, 49, 1487.
- 31) M. J. Rose, N. M. Betterley, P. K. Mascharak. Thiolate S-Oxygenation Controls Nitric Oxide (NO) Photolability of a Synthetic Iron Nitrile Hydratase (Fe-NHase) Model Derived from Mixed Carboxamide/Thiolate Ligand. *J. Am. Chem. Soc.* **2009**, 131, 8340-8341.
- 32) M. J. Rose, P. K. Mascharak. Photosensitization of Ruthenium Nitrosyls to Visible Light with an Isoelectronic Series of Heavy-Atom Chromophores: Experimental and DFT Studies on the Effects of O-, S- and Se-Substituted Coordinating Dyes. *Inorg. Chem.* **2009**, 48, 6904-6917.
- 33) N. Fry, M. J. Rose, C. Nyitray, and P. K. Mascharak. Metal Nitrosyls with Phosphine Ligation: Unexpected Ligand Oxidation and Ring Nitration. *Inorg. Chem.* **2008**, 47, 11604-11610
- 34) M. J. Rose and P. K. Mascharak. A Photosensitive {Ru-NO}⁶ Nitrosyl Bearing Dansyl Chromophore: Novel NO Donor with a Fluorometric On/Off Switch. *Chem. Commun.* **2008**, 3933-3935
- 35) M. J. Rose, N. Fry, R. Marlow, L. Hinck and P. K. Mascharak. Ruthenium Nitrosyls bearing Coordinated Fluorophores as NO Donors: a Novel Mode of Fluorometric Delivery of NO to Cells with Visible Light. *J. Am. Chem. Soc.* **2008**, 130, 8834-8846
- 36) M. J. Rose, P. K. Mascharak. Photoactive Ruthenium Nitrosyls: Effects of Light & Potential as Biological NO Donors. *Coord. Chem. Rev.* **2008**, 252, 2093-2114
- 37) M. J. Rose and P. K. Mascharak. Fiat Lux: Selective Delivery of High Flux of Nitric Oxide (NO) to Biological Targets using Photosensitive Metal Nitrosyls. *Curr. Opin. Chem. Biol.* **2008**, 12, 238-244

- 38) M. J. Rose, M. M. Olmstead and P. K. Mascharak. Photosensitization via Dye Coordination: A New Strategy to Synthesize Metal Nitrosyls that Release NO under Visible Light. *J. Am. Chem. Soc.* **2007**, *129*, 5342-5343
- 39) M. J. Rose, M. M. Olmstead and P. K. Mascharak. Photoactive Ruthenium Nitrosyls Derived from Quinoline- and Pyridine-based Ligands: Accelerated Photorelease of NO due to Quinoline Ligation. *Polyhedron* **2007**, *26*, 4713-4718
- 40) M. J. Rose, A. K. Patra, E. A. Alcid, M. M. Olmstead and P. K. Mascharak. Carboxamido and Schiff Base Ruthenium Nitrosyls: Isoelectronic Complexes with Markedly Different Properties of Photolability and Reactivity. *Inorg. Chem.* **2007**, *46*, 2328-2338
- 41) M. J. Rose,* I. Szundi,* I. Sen, A. A. Eroy-Reveles, P. K. Mascharak and Ó. Einarsdóttir. New Approach for Studying Fast Biological Reactions Involving Nitric Oxide: Generation of NO Using Photolabile Ruthenium and Manganese NO Donors. *Photochem. Photobiol.* **2006**, *82*, 1377-1384 (*equal authorship)
- 42) D. C. Swinney, M. J. Rose, A. Y. Mak, I. Lee, L. Scarafia and Y. Xu. Bi-Substrate Kinetic Analysis of an E3-Ligase-Dependent Ubiquitylation Reaction. *Methods Enzymol.* **2005**, *399*, 323-333
- 43) A. K. Patra, M. J. Rose, M. M. Olmstead and P. K. Mascharak. Reactions of Nitric Oxide with a Low-spin Fe(III) Center Ligated to a Tetradentate Di-carboxamide N4 Ligand: Parallels between Heme and Non-Heme Systems. *J. Am. Chem. Soc.* **2004**, *126*, 4780-4781
- 44) A. K. Patra, M. J. Rose, K. A. Murphy, M. M. Olmstead and P. K. Mascharak. Photolabile Ruthenium Nitrosyls with Planar Di-carboxamide Tetradentate N4 Ligands: Effects of In-plane and Axial Ligand Strength on NO Release. *Inorg. Chem.* **2004**, *43*, 4487-4495

[Industry]

- 45) M. J. Rose, I. Lee, T. R. Chapman and D. C. Swinney. Pharmacological Characterization of Clinical Anti-Cholinergic Drugs at M1-M5 Receptor Sub-types. *Mol. Biol. Cell.* **2002**, *443*, 79A
- 46) D. C. Swinney, M. J. Rose, I. Lee, A. Y. Mak. The Mono-Ubiquitination of I κ B α S32/36E *in vitro* Shows a Random Bi-Bi Kinetic Mechanism with Respect to I κ B α -*ee* and E2UBCH7. *FASEB J.* **2001**, *15*, A26

Awards and Programs

NSF-sponsored Chemistry Communication Leadership Institute, (2009): a 5-day workshop to promote science and chemistry communication to a broad audience.

Datatracer/Chemtracts Travel Grant, (2008): Conference travel grant.

Graduate Student Association (GSA) Travel Grant, (2007): Conference travel grant.

Datatracer/Chemtracts Travel Grant, (2007): Conference travel grant.

Public Policy and Biological Threats (PPBT) Conference Program, (2006): sponsored by Institute on Global Conflict & Cooperation (IGCC) and funded by Carnegie Foundation.

TA Sabbatical Fellowship, (2006).

Teaching Experience

UT Austin (Instructor)

Organometallics & Catalysis (2015). Co-listed Grad/UG course in modern catalysis

Bio-Inorganic Chemistry (2014-15). Graduate course for biological inorganic chemistry and spectroscopy

Advanced Inorganic Lab Techniques (2013-14, 2016). Upper division undergraduate laboratory

Advanced Inorganic Chemistry (2012). Graduate course on inorganic principles (co-taught with Dr Humphrey)

UC Santa Cruz (TA)

Advanced Inorganic Chemistry Laboratory (2006-07): Syntheses and characterization of metal complexes

Instrumental Analysis (2004-06): Analytical principles and instrumental analysis

Organic Chemistry, (2004): Organic chemistry lab

General Chemistry, (2003-2004): General chemistry, lab and lecture

Presented Talks

ACS San Diego, Spring 2016: Bonding and Function of Nickel-Phosphine H₂ Catalysts to Si(111) Photoelectrodes: C–C Covalent Attachment & Metal-Oxide/Phosphonate Adsorption. (Inorg: Electrochemistry)

ACS San Diego, Spring 2016: Synthetic Modeling of Mono-Iron Hydrogenase (Hmd): Utility of an Anthracene Scaffold for the Facial Display of Complex Biomimetic Donors. (Inorg: Enzymes & Models)

ACS Denver, Spring 2015: Hybrid Organic/Inorganic Band-Edge Modulation: Effect of R, Metal Oxide and Pt on H₂ Generation. (Inorg: Electrochemistry)

ACS Denver, Spring 2015: Iron-Hydride Assisted C–S Bond Cleavage in Synthetic Model Complexes of Mono-[Fe] Hydrogenase. (Inorg: Enzymes & Models)

SW Regional ACS, Nov 2014: Iron-Hydride Assisted C–S Bond Cleavage in Synthetic Model Complexes of Mono-[Fe] Hydrogenase. (Inorg: Bio-inorganic)

ACS San Francisco, Fall 2014: Synthetic Modeling of the Mono-[Fe] Hydrogenase Apo-Active Site: Pyridine and Pyridone Donors Ligated to Fe(II) Dicarboxyls. (Inorg: Enzymes & Models)

ACS San Francisco, Fall 2014: Hybrid Molecular / Materials Approach to Semiconductor Passivation and Catalyst Attachment. (Inorg: Alternative Fuels)

SW Regional ACS, Nov 2013: Synthetic Modeling of Mono-[Fe] Hydrogenase: Relevance of Pyridone and Pyridine Ligands (Inorg: Bio-inorganic)

SW Regional ACS, Nov 2012: Electrocatalytic H₂ Generation from Fluorinated Iron Glyoximes at Low Overpotentials (Inorg: Bio-inorganic)

Pacific Northwest National Lab: (November 2010) Covalent Attachment of Model Compounds and H₂-generating Catalysts to Si(111) Surfaces.

Summer Seminar in Synthetic Inorganic Chemistry (Organizer, Session Leader) (July 2010, Caltech) Towards Mono-Iron (Fe) Catalysts for H₂ Generation and Covalent Attachment to Silicon(111) Surfaces

Bioinorganic Gordon Research Seminar (GRS), (February 2010) Phosphine-based P₄N₂ Ni/Co Macrocycles and Reductive Chemistry of the Fe-dmgBF₂-(MeCN)⁺/Bu⁺NC)₂ System.

Caltech Inorganic/Organometallic Seminar (IOS), Synthetic modeling of Fe-NHase: Insights into the Effect of S-oxygenation on its Photoregulation by Nitric Oxide (NO)

University of California Joint-Campus Nitric Oxide Meeting, (Ford, Borovik, Fukuto, Mascharak Groups; 2008) Visible Light Photosensitization of Ruthenium Nitrosyls: Ligand Design and Coordinated Chromophores

Chemical Biology Bay Area (CBAA) Conference at UCSF, (2008) Synthetic Nitric Oxide Carriers: Trackable agents for light-driven NO delivery to Cells

Chemistry & Biochemistry Department Retreat, (2007) Visible Light-Driven Nitric Oxide (NO) Release from Designed Ruthenium Nitrosyls with Coordinated Chromophores

Conference Posters

- 1) G. Durgaprasad, Z.-L. Xie, M. J. Rose. Preparation, Identification and Reactivity of Iron-Hydride Species in Organometallic Synthetic Models of Mono-[Fe] Hydrogenase. *Metals in Biology, Gordon Conference*. Jan **2015**.
- 2) K. Thomas, S. Lumsden, G. Durgaprasad, M. J. Rose. Synthetic Modeling of Mono-[Fe] Hydrogenase: Exploring the Roles of Pyridone and Methylpyridine Ligands in Iron and Manganese Carbonyls. *Iron-Sulfur Enzymes, Gordon Conference*. June **2014**.
- 3) F. Li, R. Pekarek, K. Kearney, V. Basile, M. J. Rose. Hybrid Molecular/Materials Approach to Semiconductor Passivation and Functionalization for Catalysis at SC/Liquid Junctions. *Solar Fuels, Gordon Conference*. Jan **2014**.
- 4) K. Thomas, S. Lumsden, G. Durgaprasad, M. J. Rose. Synthetic Modeling of Mono-[Fe] Hydrogenase: Exploring the Roles of Pyridone and Methylpyridine Ligands in Iron and Manganese Carbonyls. *Metals in Biology, Gordon Conference*. Jan **2014**.
- 5) M. J. Rose. Synthetic Modeling of Mono-Iron [Fe]-Hydrogenase: Dissecting the Role of an Unusual Active Site. *Metals in Biology, Gordon Conference*. Jan **2013**.
- 6) M. J. Rose, R. Mercado, J. R. Winkler, and H. B. Gray. Electrocatalytic Hydrogen Generation from Fluorinated Iron Glyoximes at Low Overpotentials. *Southwest Regional ACS*, Nov **2012**.
- 7) M. J. Rose, L. E. O'Leary, J. R. Lattimer, B. S. Brunswick, H. B. Gray and N. S. Lewis. Covalent Attachment of Transition Metal Complexes to Silicon(111) Semiconductor Surfaces for Hydrogen Evolution. *ACS meeting (Denver)*, Fall **2011**.
- 8) M. J. Rose, D. E. Bellone and H. B. Gray. Syntheses and X-ray structures of tripodal tris(diphenylphosphine) Co(I/II) Complexes, and Strategy for Attachment to a Silicon(111) Semiconductor Surface. *ACS meeting (Anaheim)*, Spring **2011**.
- 9) M. J. Rose, C. Roske, J. R. Winkler and H. B. Gray. Syntheses and Structures of Diglyoxime Iron Complexes derived from the Perfluorinated Ligand Di(pentafluorophenyl)diglyoxime: Electrochemistry and Potential for Electrocatalytic Dihydrogen (H₂) Generation. *ACS meeting (Anaheim)*, Spring **2011**.
- 10) M. J. Rose, J. R. Winkler and H. B. Gray. Reductive Chemistry of Iron(II) Complexes derived from Macrocyclic Glyoximes [(dRgBF₂)₂Fe(solv)₂] (R = Me, Ph; solv = MeCN, ^tBuⁱNC). *ACS meeting (San Francisco)*, Spring **2010**.
- 11) M. J. Rose, B. S. Brunswick, J. R. Winkler and Harry B. Gray. Phosphine-based P₄N₂ Ni/Co Macrocycles and Reductive Chemistry of the Fe-dmgBF₂-(MeCN/^tBuⁱNC)₂ System. *Metals in Biology Gordon Conf & Gordon Research Seminar Bioinorganic and CCI-Solar Annual Retreat*. Winter **2010**.
- 12) M. J. Rose, N. M. Betterley, and P. K. Mascharak. Thiolate S-Oxygenation Controls Nitric Oxide (NO) Photolability of a Nitrile Hydratase (Fe-NHase) Model derived from a Mixed Carboxamide/Thiolate Ligand. *ACS meeting (San Francisco)*, Spring **2010**.
- 13) M. J. Rose and P. K. Mascharak. Photosensitization of Ruthenium Nitrosyls to Red Light with an Isoelectronic Series of Heavy-Atom Chromophores: Experimental and DFT Studies on the Effects of O-, S- and Se-substituted Coordinating Dyes. *ACS meeting (San Francisco)*, Spring **2010**.
- 14) M. J. Rose and P. K. Mascharak. Photosensitization of Ruthenium Nitrosyls to Red Light with Coordinated, Heavy-Atom Chromophores. *Southern California Inorganic Photochemistry (SCIP) Conf*, Summer **2009**.
- 15) M. J. Rose and P. K. Mascharak. A Novel Set of Fluorogenic Ruthenium NO Donors: a New Mode of Fluorimetric Delivery of NO to Cells. *ACS meeting (Philadelphia)*, Fall **2008**.
- 16) M. J. Rose and P. K. Mascharak. A Novel Set of Fluorogenic Ruthenium NO Donors: a New Mode of Fluorimetric Delivery of NO to Cells. *ACS meeting (Boston)*, Fall **2007**.
- 17) M. J. Rose, A. K. Patra, E. A. Alcid, M. M. Olmstead and P. K. Mascharak. Tuning the Photolability of the {RuNO}₆ Core of Ruthenium Nitrosyls with the Number and Orientation of Carboxamido-N Donors: A Systematic Investigation. *ACS Meeting (San Francisco)*, Fall **2006**.
- 18) M. J. Rose, A. K. Patra, M. M. Olmstead and P. K. Mascharak. Ruthenium Nitrosyls Derived from N₅ Carboxamide or N₅ Schiff Base Ligands: Comparison of Stability and Photolability in Aqueous Solution. *ACS Meeting (San Diego)*, **2005**.

- 19) M. J. Rose, I. Lee, T. R. Chapman and D. C. Swinney. Pharmacological Characterization of Clinical Anti-Cholinergic Drugs at M1–M5 Receptor Sub-types. *Mol. Pharm. Meeting (San Francisco), Mol. Biol. Cell* **2002**, 443, 79A.
- 20) D. C. Swinney, M. J. Rose, I. Lee, A. Y. Mak. The Mono-ubiquitination of I κ B α S32/36E *in vitro* Shows a Random Bi-Bi Kinetic Mechanism with Respect to I κ B α -*ee* and E2UBCH7. *FASEB J.* **2001**, 15, A26.

Commentaries/Synopses

The following journal reports/topics were summarized in short commentaries in the journal *ChemTracts: Inorganic Chemistry* (by M. J. Rose and P. K. Mascharak).

- 1) *a)* Blue Phosphorescent Emitters: New N-Heterocyclic Platinum(II) Tetracarbene Complexes. *b)* FRET-Based Sensor for Imaging Chromium(III) in Living Cells. *c)* Selective Monitoring of Parts per Million CO by Immobilized Metal Complexes on Glass. **2008**, 21(1), 37-42
- 2) *a)* Carbon Dioxide Activation at the Ni,Fe-Cluster of Anaerobic Carbon Monoxide Dehydrogenase. *b)* Reversible Single-Crystal Transformation Through Fe–O(H)Me/Fe–OH₂ Bond Formation/Bond Breaking in a Gas-Solid Reaction at an Ambient Condition. *c)* Porous Semiconducting Gels and Aerogels From Chalcogenide Clusters. *d)* Water-Soluble Porphyrins as a Dual-Function Molecular Imaging Platform for MRI and Fluorescence Zinc Sensing. *e)* Polyoxometalate Embedding of a Tetraruthenate(IV)-oxo-core by Template-Directed Metalation of [ω-SiW₁₀O₃₆]⁸⁻: A Totally Inorganic Oxygen-Evolving Catalyst. **2007**, 20(9), 387-388; 391-398
- 3) Structure of a Thiol Monolayer-Protected Gold Nanoparticle at 1.1 Å Resolution. **2007**, 20(7), 308-309
- 4) Stable Magnesium(I) Compounds with Mg-Mg Bonds. **2007**, 20(3), 125-126
- 5) Coordination-Driven Nanosized Lanthanide “Molecular Lantern” with Tunable Luminescent Properties. **2006**, 19(11), 458-459
- 6) *a)* Discrete Sandwich Compounds of Monolayer Palladium Sheets. *b)* Synthesis and Characterization of Silyldichloramines, Their Reactions with F⁻ Ions, Instability of N₂Cl₂ and NCl₂⁻, and Formation of NCl₃. **2006**, 19(9), 371-374
- 7) [Fe(CNXyl)₄]²⁻: A Structurally Characterized Homoleptic Isocyanidometalate Dianion. **2006**, 19(8), 318-323
- 8) *a)* Specific, Stable Fluorescence Labeling of Histidine-Tagged Proteins for Dissecting Multi-Protein Complex Formation. *b)* Ruthenium Half-Sandwich Complexes Bound to Protein Kinase Pim-1. *c)* Three-Coordinate Co(I) Provides Access to Unsaturated Dihydro-Co(III) and Seven-Coordinate Co(V). **2006**, 19(8), 331-336
- 9) *a)* The Zintl Ion [Pb₁₀]²⁻: Rare Example of a Homoatomic closo Cluster. *b)* Octa-Uranium Rings With Alternating Nitride and Azide Bridges. *c)* Nanoring-Nanosphere Molecule, {MO₂₁₄V₃₀}: Pushing the Boundaries of Controllable Inorganic Structural Organization at the Molecular Level. **2006**, 19(5), 205-210
- 10) *a)* Studies of Low-Coordinate Iron Dinitrogen Complexes. *b)* Disruption of Phosphoprotein-Protein Surface Interaction Using Zn(II) Dipicolylamine-Based Artificial Receptors via Two-Point Interaction. *c)* Synthesis of a Stable Compound With Fivefold Bonding Between Two Chromium(I) Centers. **2005**, 18(8), 471-475

Science in the Community | Outreach

H₂fromH₂O, (2010-present): Funded by Dreyfus Foundations and initiated with an NSF ACC/F postdoctoral fellowship. A water-splitting outreach program designed to engage students in chemistry at the middle school and high school level. The program has partnered with organizations such as GirlStart, UTeach and Hot Science Cool Talks (UT).

Pasadena High School, (2010-2012): After-school outreach program with 4-6 HS students using SHArK Kit for discovery of novel mixed metal oxides for photochemical water splitting.

Pasadena High School, (2010-2012): In-class outreach program consisting of laboratory exercises in electrochemical water-splitting to H₂ and O₂ using electrodes and solar hobby kits.

Muir High School in Pasadena, (2009-2010): outreach program consisting of laboratory exercises in light absorption, solar energy and assembling blackberry TiO₂ solar cells.

Santa Cruz County Science Fair, (Judge, Chemistry and Biochemistry; 2008)

Santa Cruz County Science Fair, (Judge, Biology and Biochemistry; 2007)