Charles (Jody) Neef, Ph.D.
Assistant Professor – Department of Chemistry

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Professional Experience

August 2012-Present: Assistant Professor in the Department of Chemistry at Pittsburg State University

- Taught Organic chemistry, Advanced Organic Chemistry, and Polymer chemistry
- Revised/updated Organic Chemistry Laboratory curriculum
- Research interests included electroactive polymers as biosensors and energy storage devices
- Responsible for $110,000 in donations and funding to the Chemistry Department
- Served on numerous university committees
- One paper published and one submitted

March 2011-July 2012: Program Faculty Member in the Department of Chemistry and Biochemistry, Texas State University, San Marcos, TX

- Responsible for $22,000 of funding to Texas State University
- Taught first and second semester organic chemistry [student evaluation scores (90%) were consistently higher than departmental average (ca. 80%)]
- Volunteered for the Financial Committee for the ACS Southwest Regional Meeting
- Research in the areas of electroactive polymers and nanocomposites
- Assisted undergraduate students with their research, writing and undergraduate research grant proposals
- Worked with small businesses on DoD SBIR and STTR solicitations
- One paper accepted published

August 2009-March 2011: Program Faculty Member in the Institute of Environment and Industrial Science, Texas State University, San Marcos, TX

- Assisted in $160,000 of funding to Texas State University
- Worked with small businesses on DoD SBIR and STTR solicitations
- Taught first and second semester organic chemistry
- Invented new thermal barrier coatings for fire protection
- Performed microencapsulation experiments in carbon dioxide
- One patent

June 2000 – March 2009: Scientist, Brewer Science, Inc., Rolla, MO

- Managed projects for Antireflective coatings (ARCs) for the Semiconductor industry
- Designed and synthesized new materials and formulations for dry etch and wet developable ARCs
- Worked with polyacrylates, polyamic acids, thermoset materials, and sol-gel materials
- Five new material platforms reach commercialization
- Received five patents and published eight papers

December 1996 - May 2000: Research Associate, University of Texas at Dallas, Richardson, TX

- Performed researched on polythiophenes and polyphenylene vinylenes
- Five published papers and one patent

October - November 1996: Consultant for Wallace, Inc., Seminole, OK

- Worked with water impermeable materials for oilfield applications
- Two patents

Educational Background:

Ph.D. in Organic Chemistry, 1996
The University of Oklahoma, Norman, OK
Dissertation Title: Synthesis, Preparation, and Electronic Properties of Ferrocene-Containing Polymers and Composites
Major Advisors: Drs. Kenneth M. Nicholas and Daniel T. Glatzhofer

M.S. in Chemistry, 1990
Texas State University, San Marcos, TX
Thesis Title: Copoly(Imidine-Esters): Monomer and Polymer Synthesis
Major Advisor: Dr. Patrick E. Cassidy

B.S. in Chemistry, 1987
Texas State University

Teaching Experience

Fall 2012 – Present: Organic Chemistry [Lecture and Laboratory] and Polymer Chemistry in the Department of Chemistry at Pittsburg State University

Fall 2009 – Spring 2012: Organic Chemistry and Chemistry for Non-Science Majors in the Department of Chemistry and Biochemistry at Texas State University

1997 - 2000: Substituted for Dr. John Ferraris in his Polymer Chemistry course upon his absence from the University of Texas at Dallas.

1993 - 1994: Head Teaching Assistant, University of Oklahoma, Norman, OK
Duties included coordination of teaching assistants, anticipation and problem solving within the laboratories, preparation and dissemination of quizzes, and grading exams.

1991 - 1993: Teaching Assistant, University of Oklahoma, Norman, OK
Responsibilities involved teaching undergraduates in microscale organic chemistry

Publications

A. Alzharani, E. Allehyani, C. Hance, and C.J. Neef, "Electrochemical Studies of Compolymers Containing Ferrocene and Maleimide", submitted to *Electrochimica Acta*.

N. Douglas, C. Neef, R. Rogers, J. Stanley, J. Armitage, B. Martin, T. Hudnall, W. Brittain, "Reactivity of tetrahydrochromeno[2,3-b]indoles: chromic indicators of cyanide", *Journal of Physical Organic Chemistry* **2013**, *26*, 688–695

J. Carberry, J.I. Irvin, D.T. Glatzhofer, K.M. Nicholas and C.J. Neef, "High Molecular Weight Copolymers of Vinylferrocene and 3-Phenyl[5]ferrocenophane-1,5-dimethylene with Various N-Substituted Maleimides", *Reactive and Functional Polymers* **2013**, *73, 730-736*

Charles J. Neef, Brian Smith, Chris James, Zhimin Zhu, and Michael Weigand, Effects of carbon/hardmask interactions on hardmask performance, *Advances in Resist Technology and Processing*, **2009**, *7273*, 7273-86

C.J. Neef, J. Finazzo, C. Nesbitt, and M. Weigand, Effects of Bake Temperature and Surface Modification of Hardmask Materials for Trilayer Applications, *Advances in Resist Technology and Processing* **2008**, *6923*, 692331

C.J. Neef, and D. Thomas, A Novel 248-nm Wet-Developable BARC for Trench Applications, SPIE Microlithography, *Advances in Resist Technology and Processing*, **2007**, *6519*, 65192Z

M. Weimer, Y. Wang, C.J. Neef, J. Claypool, K. Edwards, and Z. Zu. Materials for and Performance of Multilayer Lithography Schemes, *Advances in Resist Technology and Processing*, **2007**, *6519*, 65192S

C.J. Neef, M. Windsor, M. Nagatkina, and E. Bryant, New BARC Materials for the 65-nm Node in 193-nm Lithography, SPIE Microlithography, *Advances in Resist Technology and Processing*, **2004**

W.S. Sheng, C.J. Neef, M. Weimer, J.D. Meador, C. Devadoss, and M.G. Daffrom, A Planarization Process for Multi-Layer Lithography Applications, SPIE Microlithography, *Advances in Resist Technology and Processing*, **2004**

C.J. Neef, M. Fowler, M. Windsor, and C. Nesbit, New Materials for 193-nm BARC Application, SPIE Microlithography, *Advances in Resist Technology and Processing*, **2003**, *5039*, 872

C.J. Neef, V. Krishnamurthy, and S.R. Turner, Novel Spin Bowl Compatible Wet Developable Bottom Antireflective Coatings for i-Line Applications, ACS National Meeting, *PMSE Preprints*, **2002**, *89*

C.J. Neef and J.P. Ferraris, MEH-PPV: Improved Synthetic Procedure and Molecular Weight Control, *Macromolecules*, **2000**, *33*, 2311

C.J. Neef, I.D. Brotherston, and J.P. Ferraris, Synthesis and Electronic Properties of Poly(2-phenylthieno[3,4-b]thiophene: A New Low Band Gap Polymer, *Chem. Mater.*, **1999**, *11*, 1957

B.K. Crone, I.H. Campbell, P.S. Davids, D.L. Smith, C.J. Neef and J.P. Ferraris, Device Physics of Single Layer Organic Light-Emitting Diodes, *Journal of Applied Physics* **1999**, *86*, 5767

I.H. Campbell, D.L. Smith, C.J. Neef and J.P. Ferraris, Consistent Time-of-Flight Mobility Measurements and Polymer Light-Emitting Diode Current-Voltage Characteristics, *Applied Physics Lett.***1999**, *74*, 2809

I.H. Campbell, D.L. Smith, C.J. Neef and J.P. Ferraris, Capacitance Measurements of Junction Formation and Structure in Polymer Light-emitting Electrochemical Cells, *Applied Physics Lett.***1998**, *72*, 2565

C.J. Neef, D.T. Glatzhofer, and K.M. Nicholas, Cyclopolymerization of 3-Phenyl[5]ferrocenophane-1,5-dimethylene: Synthesis and Electronic Properties of a Poly(ferrocenophane), *J. Polym. Sci.: Pt. A Polym.Chem.*, **1997**, *35*, 3365

D.T. Glatzhofer, S. Despande, G.P. Funkhauser, and C.J. Neef, Conductive Polymers (Nonconjugated), *The Polymeric Materials Encyclopedia: Synthesis, Properties, and Applications*, Boca Raton: CRC Press, **1996**

J.A. Irvin, C.J. Neef, K.M. Kane, P.E. Cassidy, G. Tullos, and A.K. St.Clair, Polyethers Derived from Bisphenols and Highly Fluorinated Aromatics, *J. Polym. Sci.: Pt. A Polym. Chem.*, **1992**, *30*, 1675

C.J. Neef, K. Wada, W.S. Hagar, and P.E. Cassidy, Copolyimidines: 4. Copoly(imidine-esters), *Polym. Comm.*, **1991**, *32*, 405

P.E. Cassidy, C.G. Johnson, C.J. Neef, I. Jhingree, and T.M. Aminabhavi, Synthesis of Poly(benzylidene Phthalide)s: A New Class of Polymers, *J. Polym. Sci.: Pt. A Polym. Chem.*, **1991**, *29*, 1313

Oral Presentations

ACS - Midwest Regional Meeting, *Electrochemical Properties of Ferrocene-Maleimide Copolymers*, Springfield, MO, October 2013

ACS MoKanOk Sectional Meeting, *Applications of Electroactive Polymers*, November 2012

Poster Presentations

C. Hance, R.B. Westby, Charles J. Neef, *Effects of Supporting Electrolyte on the Performance of Glucose Sensors from Vinylferrocene Copolymers*, K-INBRE meeting, Kansas City, MO, January 2014

M.A. Giffin, K. Siam, C.J. Neef, *Effect of thiophene position on the electronic properties of dithienyldibenzo[a,c]phenazine*, ACS Midwest Regional Meeting, Springfield, MO, October 2013

A. Alzharani, E. Allehyani, C.J. Neef, *Electrochemical and thermal properties of copolymers from vinylferrocene with various para substituted phenylmaleimides*, ACS Midwest Regional Meeting, Springfield, MO, October 2013

E. Allehyani, A. Alzharani, Charles J. Neef, *Electrochemical and thermal properties of copolymers from 3-phenyl[5]ferrocenophane-1,5-dimethylene and various para substituted phenylmaleimides*, ACS Midwest Regional Meeting, Springfield, MO, October 2013

A. Alzharani, E. Allehyani, and C.J. Neef, *Effects of Electrolyte on the Redox Properties of Ferrocene Containing Polymers*, ACS Pentasectional meeting in Tulsa, OK, 8 March 2013

D. Base and C.J. Neef, *Use of α,α'-Dicyanostillbene as an Electron Acceptor in D-A-D Systems with Thiophene*, Pittsburg State University Research Colloquium, 15 April 2013

Patents

U.S. Patent: D.M. Sullivan, C.J. Neef, Y. Wang, T. Ouattara, Metal-Oxide films from Small Molecules for Lithographic Applications, **2011**, submitted

U.S. Patent: C.J. Neef, C.E. Powell, J.L. Massingill, Thermal Barrier Coatings, **2010**, submitted

U.S. Patent 20090035590: D.M. Sullivan; R. Huang, C.J. Neef, J. Dai, M.B. Swope, Non-Covalently Crosslinkable, Materials for Photolithography Processes, **2009**

U.S. Patent 7,510,004: J.E. Hessert, D.D. Wallace, J.D. DeLong, C.J. Neef, Method for treating an underground formation, **2009**

U.S. Patent 7,323,289 B2: C.J. Neef, M. Bhave, M. Fowler, M. Windsor, and C. Nesbit, Bottom Antireflective Coatings Derived from Small Core Molecules with Multiple Epoxy Moieties, **2008**

U.S. Patent 7,261,997 B2: R.C. Cox and C.J. Neef, Spin Bowl Compatible Polyamic Acids/Imides as Wet Developable Polymer Binders for Anti-Reflective Coatings, **2007**

U.S. Patent 6,872,506 B2: V. Krishnamurthy, C.J. Neef, and J.A.M. Snook, Wet-Developable Anti-Reflective Compositions, **2005**

U.S. Patent 6,740,469 B2: V. Krishnamurthy, C.J. Neef, and J.A.M. Snook, Developer-Soluble Metal Alkoxide Coatings for Microelectronic Applications, **2004**

U.S. Patent 6,667,279: D. Wallace, J. Hesser, and C.J. Neef; Method and Composition for Forming Water Impermeable Barrier, **2003**

U.S. Patent 6,426,399: J.P. Ferraris and C.J. Neef, Methods for the Synthesis and Polymerization of alpha,alpha-dihalo-p-xylenes, **2002**

Proposals

Ford Motor Company, Novel Materials containing Thiophene and Benzobisthiazoles for ESD Protection, April 2014, $61,928

Kansas IDeA Network of Biomedical Research Excellence, *Copolymers Containing Vinylferrocene and Vinylpyridinium for Use in Dopamine Sensors*, March 2014, $4,000

Kansas EPSCoR, *Composites derived from CNTs and copolymers containing vinylferrocenes with pyrene substituted maleimides as electron acceptors for photovoltaic applications*, March 2014, $37,359

Pittsburg State University - Undergraduate Research Stipend for Austin Bailey, *Decaborane salts for Reduction of Corrosion in Nuclear Plants*, February 2014, **Funded** - $1,000

NSF-Energy for Sustainability, *RUI: Synthesis and Characterization of Benzobisazole containing Polythiophenes for Supercapacitor and Photovoltaic Applications*, February 2014, $118,375

Pittsburg State University - Undergraduate Research Stipend for Michael Giffin, *Electroactive Polymers Containing 11,12-Dimethyldibenzo[a,c]phenazine*, January 2014, $1,000

ACS – Petroleum Research Fund Undergraduate Research Institute, *Synthesis and Characterization of Novel Polythiophenes for Gas Sensing Application*, November 2013, $55,000

Research Corporation for Science Advancement, *Electroactive Polymers Containing Dibenzo[a,c]phenazine: Synthesis, MO Calculations, and Characterization*, June 2013, $100,000

Pittsburg State University - Undergraduate Research Agreement, *Novel Copolymers Derived from Vinylferrocenes and Styrenic Monomers*, April 2013, **Funded** - $1,875

Pittsburg State University - College of Arts and Sciences Student Equipment Fees, *Request for Organic Laboratory Glassware*, March 2013, **Funded** - $10,000

K-INBRE Recruitment/Start-up Proposal, Biosensors Derived from Ferrocene Containing Polymers, January 2013, **Funded** - $30,100

ACS – Petroleum Research Fund Undergraduate Research Institute, *Synthesis and Characterization of Novel Polythiophenes for Gas Sensing Application*, November 2012, $50,000

Pittsburg State University - Summer Teaching Enhancement Grant, *Revision and Update to the Organic Chemistry Laboratories*, September 2012 - **Funded**