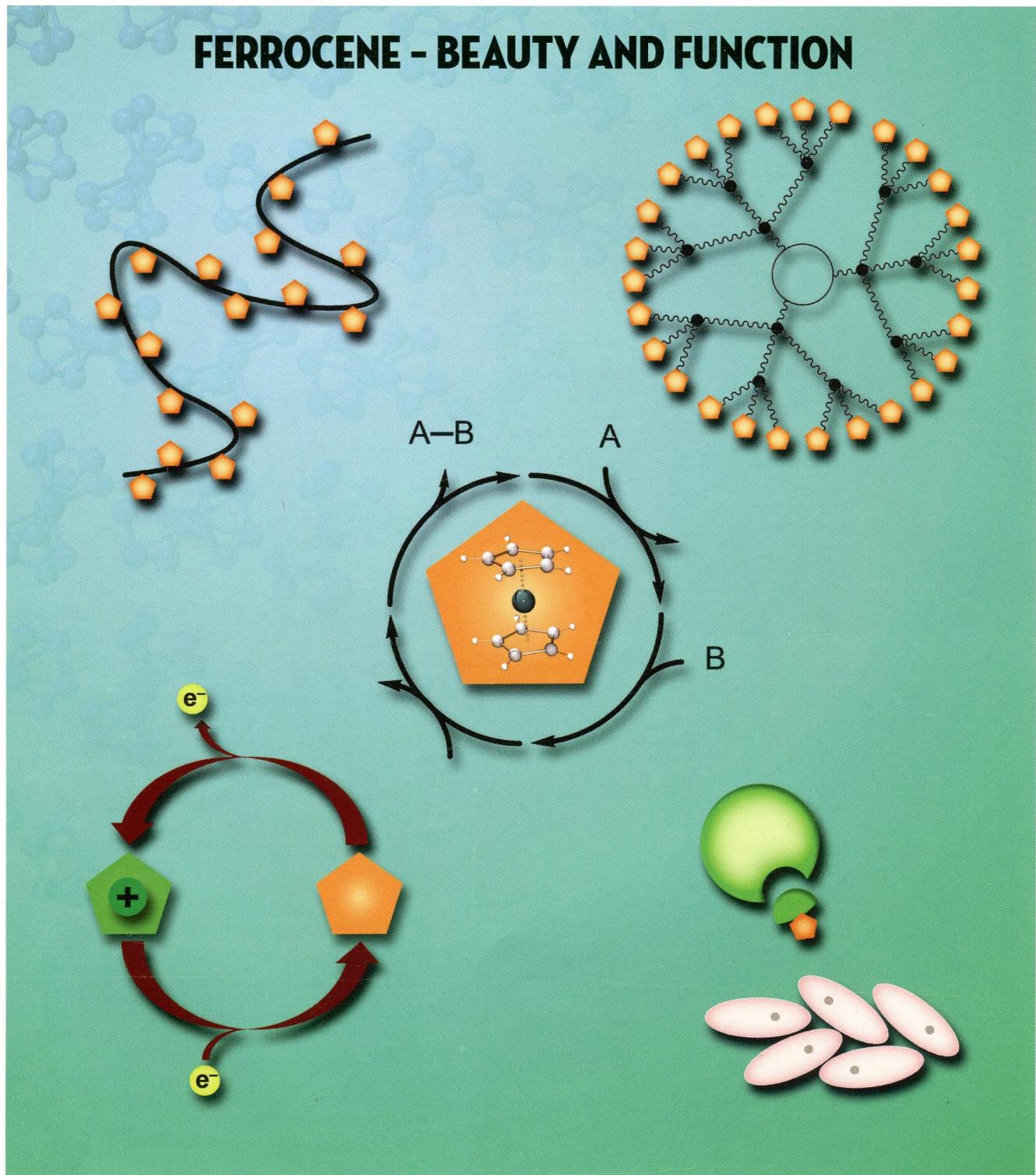


# ORGANOMETALLICS

## FERROCENE - BEAUTY AND FUNCTION



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**ON THE COVER:** Recent advances in the chemical, structural, mechanistic, and physiochemical properties of ferrocene and ferrocene-based molecules are surveyed in this special compendium of articles by leading researchers worldwide; numerous applications ranging from homogeneous catalysis through new materials to bioorganometallic chemistry are featured as well.

## SPECIAL ISSUE: FERROCENE—BEAUTY AND FUNCTION

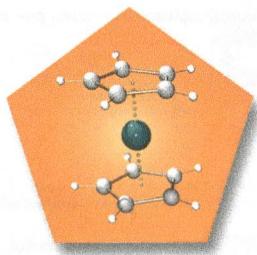
### Editor's Page

5623

[dx.doi.org/10.1021/om400962w](http://dx.doi.org/10.1021/om400962w)

#### Ferrocene—Beauty and Function

Katja Heinze\* and Heinrich Lang\*



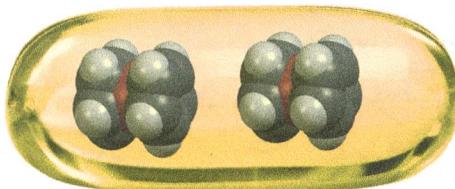
### Reviews

5626

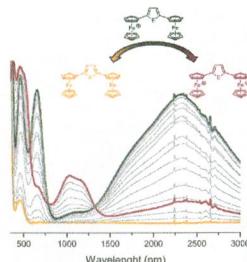
[dx.doi.org/10.1021/om400446y](http://dx.doi.org/10.1021/om400446y)

#### A New Age for Iron: Antitumoral Ferrocenes

Susana S. Braga\* and Artur M. S. Silva

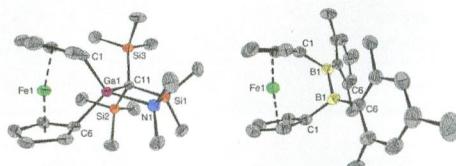


**(Multi)ferrocenyl Five-Membered Heterocycles: Excellent Connecting Units for Electron Transfer Studies**  
 Alexander Hildebrandt and Heinrich Lang\*



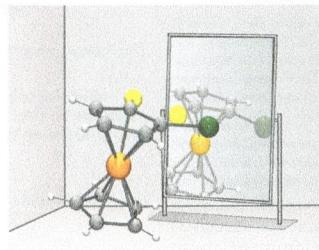
**Strained Ferrocenophanes**

Rebecca A. Musgrave, Andrew D. Russell, and Ian Manners\*



**Selective Syntheses of Planar-Chiral Ferrocenes**

Dieter Schaarschmidt and Heinrich Lang\*



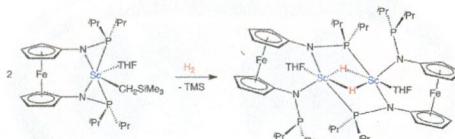
## Communications

5705

S

### Synthesis of a Dinuclear Ferrocene-Linked Bis(phosphinoamide)scandium Hydride Complex

Nathan R. Halcovitch and Michael D. Fryuk\*



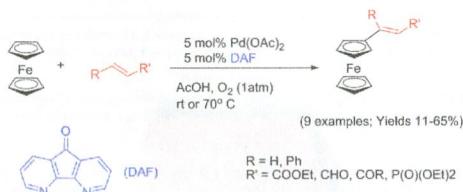
5709

S

dx.doi.org/10.1021/om400410u

### Aerobic Dehydrogenative Heck Reaction of Ferrocene with a Pd(OAc)<sub>2</sub>/4,5-Diazafluoren-9-one Catalyst

Michał Piotrowicz and Janusz Zakrzewski\*



## Articles

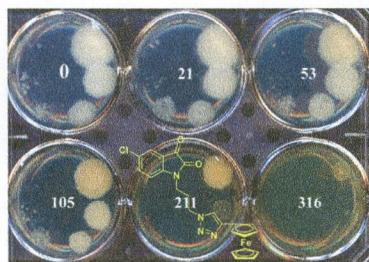
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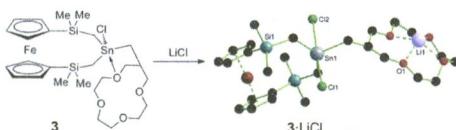
### 1*H*-1,2,3-Triazole-Tethered Isatin–Ferrocene and Isatin–Ferrocenylchalcone Conjugates: Synthesis and *in Vitro* Anti-tubercular Evaluation

Kewal Kumar, Séverine Carrère-Kremer, Laurent Kremer, Yann Guérardel, Christophe Biot,\* and Vipan Kumar\*



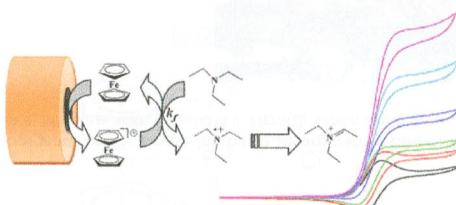
**Novel Tin-Containing Crown Ether Substituted Ferrocenophanes as Redox-Active Hosts for the Ditetopic Complexation of Lithium Chloride**

Anicet Siakam Wendji, Michael Lutter, Christina Dietz, Viatcheslav Jouikov,\* and Klaus Jurkschat\*



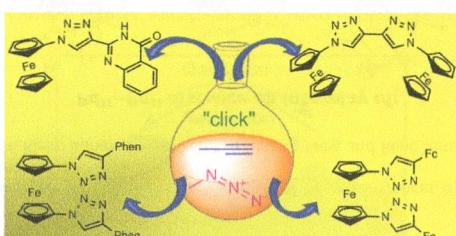
**Homogeneous Electron-Transfer Reaction between Electrochemically Generated Ferrocenium Ions and Amine-Containing Compounds**

Angel A. J. Torriero,\* Muhammad J. A. Shiddiky, Iko Burgar, and Alan M. Bond\*



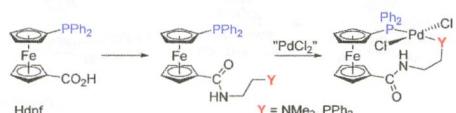
**Preparation, Structural Characterization, Electrochemistry, and Sensing Properties toward Anions and Cations of Ferrocene-Triazole Derivatives**

Tomás Romero, Raúl A. Orenes, Alberto Tárraga,\* and Pedro Molina\*



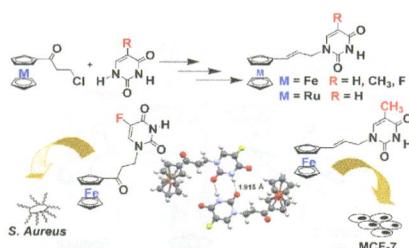
**Synthesis, Coordination Properties, and Catalytic Use of Phosphinoferrocene Carboxamides Bearing Donor-Functionalized Amide Substituents**

Petr Štěpnička,\* Barbora Schneiderová, Jiří Schulz, and Ivana Císařová



**Metallocene-Modified Uracils: Synthesis, Structure, and Biological Activity**

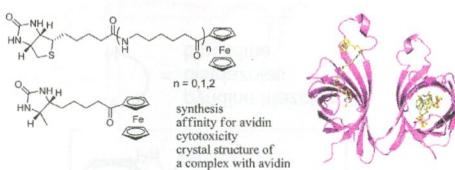
Konrad Kowalski,\* Joanna Skiba, Luciano Oehninger, Ingo Ott, Jolanta Solecka, Aleksandra Rajnisz, and Bruno Therrien



dx.doi.org/10.1021/om400312f

**Ferrocene–Biotin Conjugates Targeting Cancer Cells: Synthesis, Interaction with Avidin, Cytotoxic Properties and the Crystal Structure of the Complex of Avidin with a Biotin–Linker–Ferrocene Conjugate**

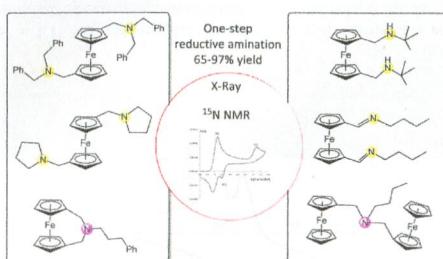
Damian Plażuk, Janusz Zakrzewski,\* Michèle Salmain, Andrzej Blauż, Błażej Rychlik, Paweł Strzelczyk, Anna Bujacz, and Grzegorz Bujacz



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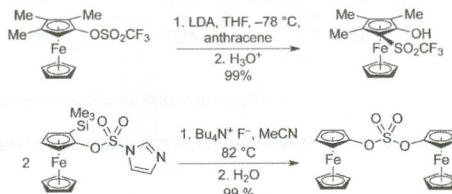
**Aminomethyl-Substituted Ferrocenes and Derivatives: Straightforward Synthetic Routes, Structural Characterization, and Electrochemical Analysis**

Nejib Dwadnia, Fatima Allouch, Nadine Pirio, Julien Roger, Hélène Cattey, Sophie Fournier, Marie-Josée Penouilh, Charles H. Devillers, Dominique Lucas, Daoud Naoufal, Ridha Ben Salem, and Jean-Cyrille Hierso\*



**Anionic Thia-Fries Rearrangements of Electron-Rich Ferrocenes and the Unanticipated Formation of Diferrocenyl Sulfate from 2-(Trimethylsilyl)ferrocenyl Imidazolylsulfonate**

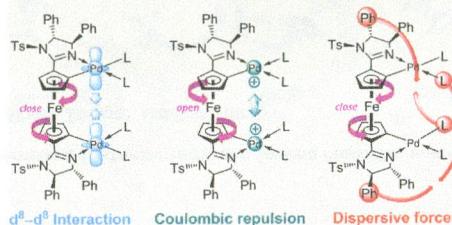
Georg Werner and Holger Butenschön\*



**Monomeric Ferrocene Bis-Imidazoline Bis-Palladacycles: Variation of Pd–Pd Distances by an Interplay of Metallophilic, Dispersive, and Coulombic Interactions**

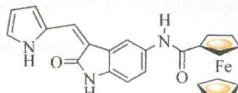
Manuel Weber, Johannes E. M. N. Klein, Burkhard Miehlich,\* Wolfgang Frey, and René Peters\*

**Pd<sup>II</sup>...Pd<sup>II</sup> distance an interplay of:**

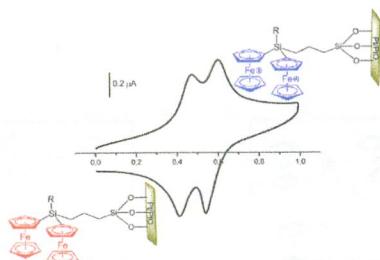


**Synthesis of Oxindole-Based Bioorganometallic Kinase Inhibitors Incorporating One or More Ferrocene Groups**

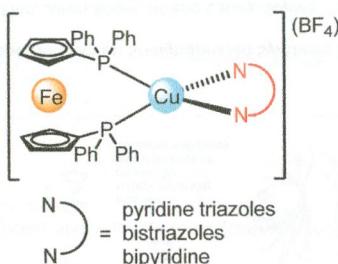
Jahangir Amin, Irina S. Chuckowree, Minghua Wang, Graham J. Tizzard, Simon J. Coles, and John Spencer\*



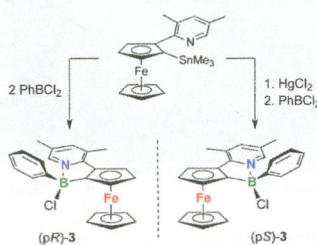
**Synthesis and Electrochemistry of ((Diferrocenylsilyl)propyl)- and ((Triferrocenylsilyl)propyl)triethoxysilanes**  
 Marta Herrero, Raquel Sevilla, Carmen M. Casado,\* José Losada, Pilar García-Armada, Antonio Rodríguez-Díéguez, David Briones, and Beatriz Alonso\*



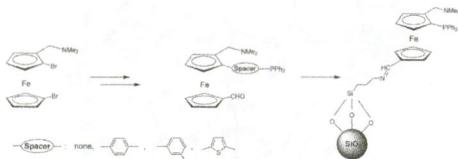
**Heterobimetallic Cu–dppf (dppf = 1,1'-Bis(diphenylphosphino)ferrocene) Complexes with “Click” Derived Ligands: A Combined Structural, Electrochemical, Spectroelectrochemical, and Theoretical Study**  
 David Schweinfurth, Nadin Büttner, Stephan Hohloch, Naina Deibel, Johannes Klein, and Biprajit Sarkar\*



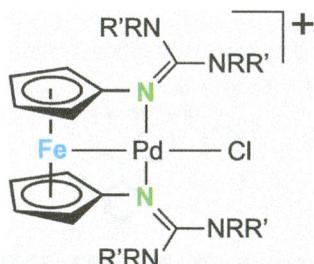
**Stereoselective Ortho Borylation of Pyridylferrocenes**  
 Jiawei Chen, Roger A. Lalancette, and Frieder Jäkle\*



**Synthesis of 1,1',2-Trisubstituted Aryl-Based Ferrocenyl Phosphines as Precursors for Immobilized Ligands**  
 Martyna Madalska, Peter Lönnecke, Vladimir Ivanovski, and Evamarie Hey-Hawkins\*

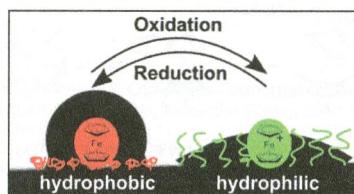


**Ferrocene-Based Bis(guanidines): Superbases for Tridentate N,Fe,N-Coordination**  
 Lutz R. R. Klapp, Clemens Bruhn, Michael Leibold, and Ulrich Siemeling\*



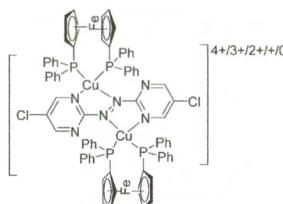
**Ferrocene Polymers for Switchable Surface Wettability**

Johannes Elbert, Markus Gallei,\* Christian Rüttiger, Annette Brunsen, Haiko Didzoleit, Bernd Stühn, and Matthias Rehahn



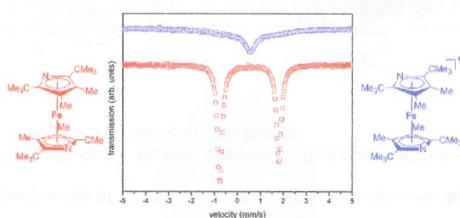
**A Ligand-Bridged Heterotetranuclear ( $\text{Fe}_2\text{Cu}_2$ ) Redox System with  $\text{Fc}/\text{Fc}^+$  and Radical Ion Intermediates**

Rajkumar Jana, Falk Lissner, Brigitte Schwederski, Jan Fiedler, and Wolfgang Kaim\*



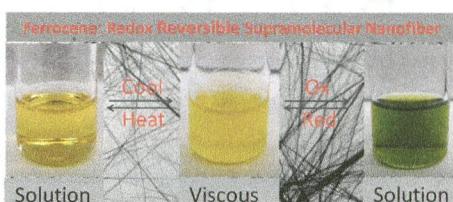
**Synthesis and Reactivity of Sterically Encumbered Diazaferrocenes**

Markus Kreye, Dirk Baabe, Peter Schreyen, Matthias Freytag, Constantin G. Daniliuc, Peter G. Jones, and Marc D. Walter\*

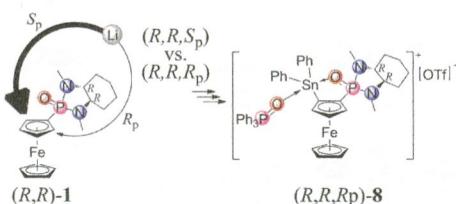


**Ferrocene-Tryptophan Conjugate: An Example of a Redox-Controlled Reversible Supramolecular Nanofiber Network**

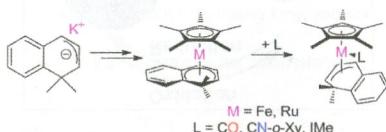
Bimalendu Adhikari, Rouzbeh Afrasiabi, and Heinz-Bernhard Kraatz\*



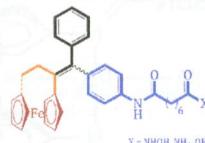
**Diastereoselective *ortho*-Metalation of a Chiral Ferrocenylphosphonic Diamide and Its Organotin Derivatives**  
Christina Dietz, Viatcheslav Joukov, and Klaus Jurkschat\*



**Half-Open Ferrocenes and Ruthenocenes Containing an Edge-Bridged Open Indenyl Ligand**  
Jeroen Volbeda, Constantin G. Daniliuc, Peter G. Jones, and Matthias Tamm\*

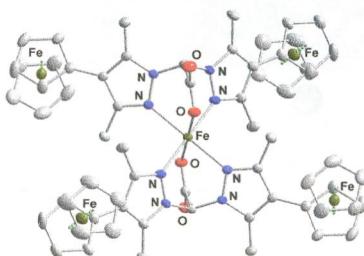


**Synthesis, Characterization, and Antiproliferative Activities of Novel Ferrocenophanic Suberamides against Human Triple-Negative MDA-MB-231 and Hormone-Dependent MCF-7 Breast Cancer Cells**  
José de Jesús Cázares-Marinero, Oliver Buriez, Eric Labb  , Siden Top,\* Christian Amatore, and G  rard Jaouen\*



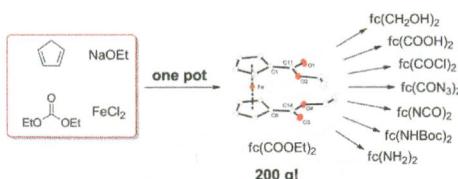
**Bis(pyrazol-1-yl)acetic Acid Bearing Ferrocenyl Substituents**

Stefan Tampier, Sascha M. Bleifuss, Mokhles M. Abd-Elzaher, J  rg Sutter, Frank W. Heinemann, and Nicolai Burzlaff\*



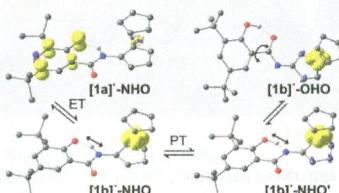
**Large-Scale Preparation of 1,1'-Ferrocenedicarboxylic Acid, a Key Compound for the Synthesis of 1,1'-Disubstituted Ferrocene Derivatives**

Alex R. Petrov, Kristof Jess, Matthias Freytag, Peter G. Jones, and Matthias Tamm\*



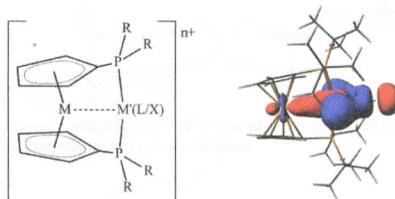
**Proton-Coupled Electron Transfer in Ferrocenium–Phenolate Radicals**

Andreas Neidlinger, Vadim Ksenofontov, and Katja Heinze\*

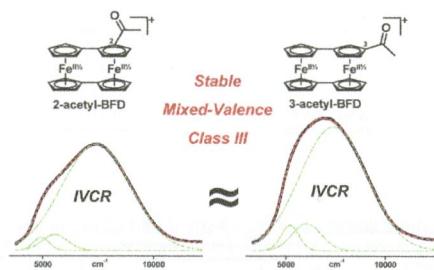


**Palladium(II) and Platinum(II) Compounds of 1,1'-Bis(phosphino)metallocene ( $M = Fe, Ru$ ) Ligands with Metal–Metal Interactions**

Kathryn M. Gramigna, Jeremy V. Orias, Chelsea L. Mandell, Margaret A. Tiedemann, William G. Dougherty, Nicholas A. Piro, W. Scott Kassel, Benny C. Chan, Paula L. Diaconescu, and Chip Nataro\*

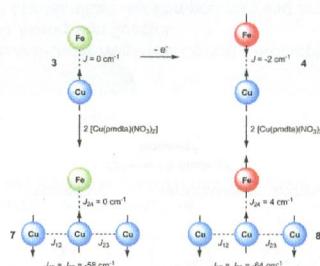


**Unsymmetrically Substituted 1,1'-Biferrocenylenes Maintain Class III Mixed-Valence Character**  
Rochus Breuer and Michael Schmittel\*



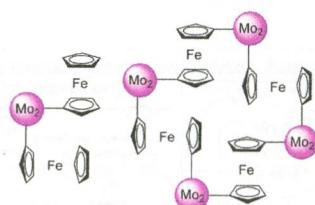
**Redox-Active Ferrocene as a Tuning Functionality for Magnetic Superexchange Interactions of Bis(oxamato) Type Complexes**

Mohammad A. Abdulmalic, Azar Aliabadi, Andreas Kurt Petr, Yulia Krupskaya, Vladislav Kataev, Bernd Büchner, Torsten Hahn, Jens Kortus, Nicolas Yèche, Hans-Henning Klauss, and Tobias Rüffer\*



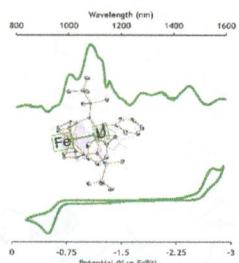
**Synthesis and Characterization of Dimolybdenum(II) Complexes Connected by Carboxylate Linkers**

Xu-Min Cai, Dominik Höhne, Mathias Köberl, Mirza Cokoja, Alexander Pöthig, Eberhardt Herdtweck, Stefan Haslinger, Wolfgang A. Herrmann,\* and Fritz E. Kühn\*

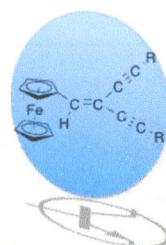


**Investigation of the Electronic Structure of Mono(1,1'-Diamidoferrocene) Uranium(IV) Complexes**

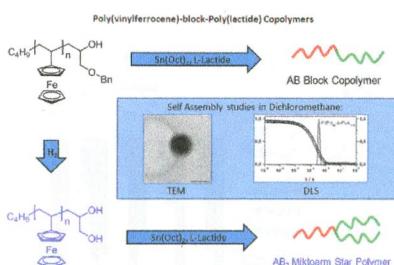
Selma Duhović, Jeremy V. Oria, Samuel O. Odoh, Georg Schreckenbach, Enrique R. Batista, and Paula L. Diaconescu\*

**Syntheses, Spectroelectrochemical Studies, and Molecular and Electronic Structures of Ferrocenyl Ene-diyne**

Kevin B. Vincent, Qiang Zeng, Matthias Parthey, Dmitry S. Yufit, Judith A.K. Howard, František Hartl,\* Martin Kaupp,\* and Paul J. Low\*

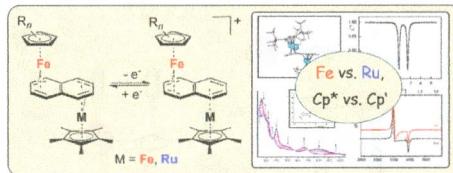
**Redox-Responsive Block Copolymers: Poly(vinylferrocene)-*b*-poly(lactide) Diblock and Miktoarm Star Polymers and Their Behavior in Solution**

Jan Morsbach, Adrian Natalello, Johannes Elbert, Svenja Winzen, Anja Kroeger, Holger Frey,\* and Markus Gallei\*



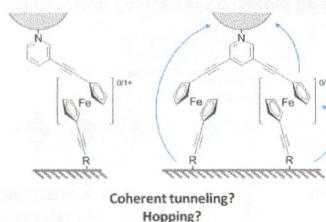
**Synthesis and Electronic Structure of Dissymmetrical, Naphthalene-Bridged Sandwich Complexes  $[Cp'Fe(\mu-C_{10}H_8)MCp^*]^x$  ( $x = 0, +1$ ;  $M = Fe, Ru$ ;  $Cp' = \eta^5-C_5H_2-1,2,4-tBu_3$ ;  $Cp^* = \eta^5-C_5Me_5$ )**

Jennifer Malberg, Elizabeth Lupton, Eva-Maria Schnöckelborg, Bas de Bruin, Jörg Sutter, Karsten Meyer, František Hartl,\* and Robert Wolf\*



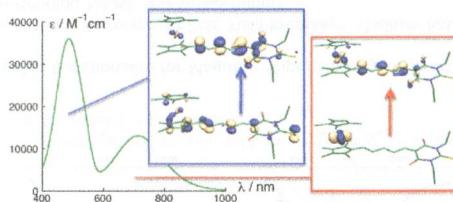
**Branched Redox-Active Complexes for the Study of Novel Charge Transport Processes**

Michael S. Inkpen, Tim Albrecht,\* and Nicholas J. Long\*



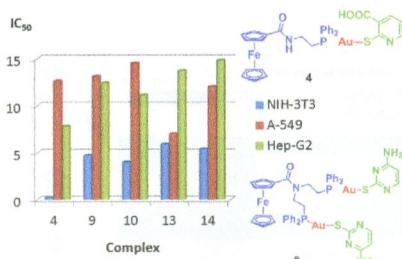
**Dipolar Ferrocene and Ruthenocene Second-Order Nonlinear Optical Chromophores: A Time-Dependent Density Functional Theory Investigation of Their Absorption Spectra**

Seyhan Salman, Jean-Luc Brédas, Seth R. Marder, Veaceslav Coropceanu,\* and Stephen Barlow\*

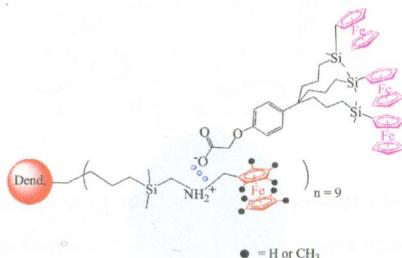


**Antitumoral Gold and Silver Complexes with Ferrocenyl-Amide Phosphines**

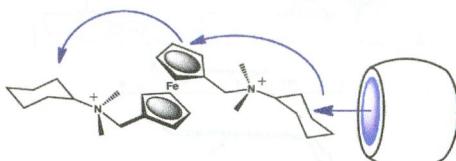
Helen Goitia, Yolanda Nieto, M. Dolores Villacampa, Cornelia Kasper, Antonio Laguna, and M. Concepción Gimeno\*

**Ferrocenyl Dendrimers with Ionic Tethers and Dendrons**

Amalia Rapakousiou, Yanlan Wang, Frida Nzulu, Rodrigue Djeda, Noël Pinaud, Jaime Ruiz, and Didier Astruc\*

**Binding Interactions between Cucurbit[n]uril Hosts and Tritopic, Dicationic Guests Containing a Central Ferrocenyl and Two Terminal Aminocyclohexyl Sites**

Wei Li and Angel E. Kaifer\*

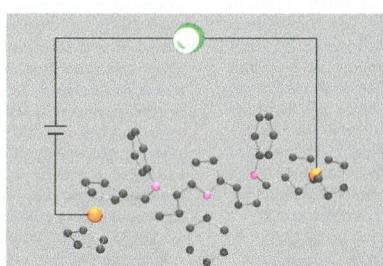


**Synthesis of Ferrocenyl and Ruthenocenyl Thioamide Derivatives Using a Single-Step Three-Component Reaction**  
Malay Patra,\* Jeannine Hess, Sandro Konatschnig, Bernhard Spingler, and Gilles Gasser\*

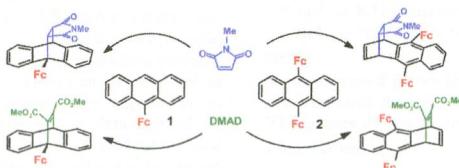


**Molecular Wires using (Oligo)pyrroles as Connecting Units: An Electron Transfer Study**

Ulrike Pfaff, Alexander Hildebrandt, Dieter Scharschmidt, Tobias Rüffer, Paul J. Low, and Heinrich Lang\*

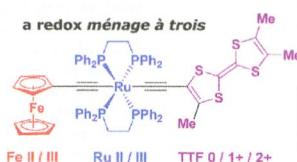


**Diels–Alder Reactions of 9-Ferrocenyl- and 9,10-Diferrocenylanthracene: Steric Control of 9,10- versus 1,4-Cycloaddition**  
Kirill Nikitin,\* Helge Müller-Bunz, and Michael J. McGlinchey\*



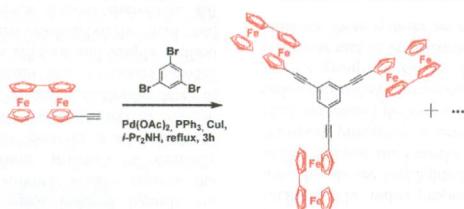
**Ferrocene and Tetrathiafulvalene Redox Interplay across a Bis-acetylide–Ruthenium Bridge**

Antoine Vacher, Frédéric Barrière,\* and Dominique Lorcé\*



**Poly(Biferrocenylethynyl)arene and Bis(biferrocenyl)diynyl Complexes and Their Redox Chemistry**

Yanlan Wang, Amalia Rapakousiou, Guillaume Chastanet, Lionel Salmon, Jaime Ruiz, and Didier Astruc\*



The synthesis of ferrocene-based polymers has been extensively studied over the past two decades. The introduction of ferrocene units into the polymer backbone can significantly improve the properties of the polymers, such as thermal stability, electrical conductivity, and magnetic properties. In this work, we report the synthesis of two new ferrocene-based polymers: poly(biferrocenylethynyl)arene and bis(biferrocenyl)diynyl complexes. The poly(biferrocenylethynyl)arene was synthesized by the reaction of two ferrocene units with 1,4-dibromobutene in the presence of  $\text{Pd}(\text{OAc})_2$ ,  $\text{PPh}_3$ ,  $\text{CuI}$ , and  $i\text{-Pr}_2\text{NH}$  at reflux for 3 h. The resulting polymer chain consists of a ferrocene unit linked to a 1,4-phenylene ring via an ethynyl group ( $-\text{C}\equiv\text{C}-\text{C}_6\text{H}_4-\text{C}\equiv\text{C}-$ ). The bis(biferrocenyl)diynyl complexes were also synthesized by the same reaction conditions, but with a different ratio of ferrocene and 1,4-dibromobutene. The resulting complexes consist of two ferrocene units linked to a central diynyl group ( $-\text{C}\equiv\text{C}-\text{C}\equiv\text{C}-$ ) via 1,4-phenylene rings.

The redox properties of these polymers were investigated by cyclic voltammetry. The poly(biferrocenylethynyl)arene shows a reversible oxidation peak at approximately 0.7 V versus  $\text{Ag}/\text{AgCl}$ . The reduction peak is observed at approximately -0.2 V. The bis(biferrocenyl)diynyl complexes show a reversible oxidation peak at approximately 0.7 V versus  $\text{Ag}/\text{AgCl}$ . The reduction peak is observed at approximately -0.2 V. The redox behavior of these polymers is similar to that of individual ferrocene units, indicating that the ferrocene units are not significantly perturbed by the polymer backbone.

In conclusion, we have synthesized two new ferrocene-based polymers: poly(biferrocenylethynyl)arene and bis(biferrocenyl)diynyl complexes. These polymers exhibit interesting redox properties, which may be useful for applications in various fields, such as sensors, actuators, and catalysts.

**Supporting Information** available via online article includes the following: detailed synthesis of the polymers, characterization data (IR, NMR, GPC), and cyclic voltammograms. This information is available free of charge via the Internet at [dx.doi.org/10.1021/om400864q](http://dx.doi.org/10.1021/om400864q).

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