

RICHARD R. SCHROCK

rrs@mit.edu

Field Inorganic and Organometallic Chemistry, Catalysis, Polymer Chemistry**Current Research Interests** Synthetic and mechanistic organo-transition metal chemistry, multiple metal-carbon and nitrogen bonds, homogeneous catalysis, dinitrogen reduction, olefin metathesis, and applications of olefin metathesis to organic and polymer chemistry.**Personal** Born: January 4, 1945; Berne, Indiana
Married: Nancy F. Carlson, 1971; two children**Education**1971-1972 Postdoctoral study, Cambridge University, England
1971 Ph.D., Harvard University, Cambridge, Massachusetts
1967 A. B., University of California, Riverside, California**Professional Experience**2019-present Professeur Conventionné, ISIS, University of Strasbourg (partial)
2018-present Distinguished Professor and George K. Helmkamp Founder's Chair of
Chemistry, University of California, Riverside (partial)
2018-present Frederick G. Keyes Professor of Chemistry Emeritus, MIT
1989-2018 Frederick G. Keyes Professor of Chemistry, MIT
1980-1989 Professor of Chemistry, MIT
1978-1980 Associate Professor of Chemistry, MIT
1975-1978 Assistant Professor of Chemistry, MIT
1972-1975 Research Chemist, E.I. du Pont de Nemours & Co., CRD**Scholarships, Fellowships, Awards, Honorary Degrees**2018 Academician of Honor, Real Academia Europea de Doctores
Honorary Professor of Northwest University (China)
2017 James R. Killian Jr. Faculty Achievement Award
Honorary Professor of Chengdu University (China)
2015 Humboldt Fellow, Stuttgart
Peter Wall Institute Scholar, UBC
2014 Elected AAAS Fellow
Organometallics Senior Investigator Fellowship
Paracelsus Prize, Swiss Chemical Society
Solvay Chair of Chemistry, University of Brussels
2013 Fellow of Lincoln College, Oxford
JSPS Fellowship, Nara, Japan
Honoris Causa, University of St. Andrews
Honoris Causa, University of Aachen (RWTH Aachen)
2012 Alan G. MacDiarmid Award, University of Pennsylvania
2011 Massachusetts Academy of Sciences Fellow
2009 Honoris Causa, University of Rennes
2008 Honoris Causa, University of Zaragoza
University of Auckland Hood Fellow
Jabir Ibn Hyyan (Geber) Medal, Saudi Chemical Society

2007	Basolo Medal, Northwestern University and the ACS Chicago section
2006	Distinguished Alumnus Award, University of California, Riverside F. Albert Cotton ACS Award in Synthetic Inorganic Chemistry Theodore W. Richards Medal, Northeast ACS section Chancellor's Medal, University of California, Riverside
2005	Nobel Prize in Chemistry with Y. Chauvin and R. H. Grubbs August Wilhelm von Hofmann Medal, German Chemical Society Mack Award, Ohio State University
2004	Royal Society of Chemistry Sir Edward Frankland Prize
2002	Royal Society of Chemistry Sir Geoffrey Wilkinson Medal
2001	American Chemical Society Cope Scholar Award
1998	Bailar Medal, University of Illinois
1996	American Chemical Society Award in Inorganic Chemistry
1995	Humboldt Senior Research Award
1993	JSPS Fellowship, Kyoto, Japan
1992	Elected National Academy of Sciences
1991	Bye Fellow, Robinson College, Cambridge University SERC Visiting Fellow, Cambridge University Royal Society of Chemistry Centenary Lecturer and Medalist
1990	Harrison Howe Award of the Rochester Section of the ACS
1986	Sherman T. Fairchild Scholar, California Institute of Technology
1985	American Chemical Society Award in Organometallic Chemistry
1978-1983	Camille and Henry Dreyfus Teacher-Scholar, MIT
1976-1978	Alfred P. Sloan Fellow, MIT
1971-1972	National Science Foundation Postdoctoral Fellow, Cambridge

Membership in Professional Societies

National Academy of Sciences, American Academy of Arts and Sciences, American Chemical Society, Honorary Member of the World Innovation Foundation, Honorary Fellow of the Royal Society of Chemistry, Foreign Member of the Royal Society of London, Foreign Member of the Korean Academy of Science and Technology

Public and Professional Service

Member of the Advisory Board *Helvetica Chimica Acta* 2016-.
NIH Study Section, 2016
Committee of Visitors, NSF Division of Chemistry 2013.
Lindau Nobel Laureate Meeting, Lindau Germany, 2013.
NSF Alan T. Waterman Award Committee, 2011-2014.
Chair of the Editorial Board of *Chemical Communications*, 2012-2015.
Lindau Nobel Laureate Meeting, Lindau Germany, 2009.
Scientific Advisory Board of the Welch Foundation, 2008-2020.
Member of the Harvard University Board of Overseers, 2007-2013.
Member of the Advisory Board, *Chemistry - An Asian Journal* 2006-.
Lindau Nobel Laureate Meeting, Lindau Germany, 2006.
Chair, Review Committee for the Chemistry Division at Argonne National Laboratory, 2004.
Member of the Scientific Advisory Board of MPI Mülheim 2006-2012.
Member of the Scientific Advisory Board of the Institute for Advanced Study, TU Munich.
Member, NRC Committee for the Energy and Transportation Workshop, 2002.
Organizer, 14th International Symposium on Olefin Metathesis and Related Processes, 2001.

Member, Advisory Board, *Chemical and Engineering News*, 2000-2002.
 Member, Academic Advisory Board, *Advanced Synthesis and Catalysis*, 2000-2003.
 Member, Editorial Advisory Board, *Inorganic Chemistry*, 2001-2004.
 Member, Editorial Advisory Board, *Journal of Polymer Science*, 2000-2003.
 Chair, Vaska Symposium, NE Regional ACS meeting, 1999.
 Chair, Organometallic Gordon Research Conference, 1998.
 Member, ACS JACS Review Task Force, 1989-1990.
 Organizer, ACS Symposium on Olefin Polymerization, Boston, 1990.
 Chairman, ACS Organometallic Subdivision, 1988-1989.
 Member, Editorial Advisory Board, *Organometallics*, 1989-92.
 Member, Editorial Advisory Board, *Accounts of Chemical Research*, 1988-1991.
 Associate Editor, *Organometallics*, 1981-1989.
 Member, National Science Foundation Advisory Panel in Chemistry, 1978-1981.
 Member, National Research Council Army Basic Research Committee, 1978-1981.
 Member, National Institutes of Health Metallobiochemistry Study Section, 1983-1987.
 Chairman, Microsymposium, "Transition Metals in Synthesis and Catalysis", MIT, 1983.
 Member, Organizing Committee for 20th Mechanisms Conference, Duke University, 1984.
 Chairman, NERM 14 Symposium, "Recent Advances in Organometallic Chemistry", 1984.
 Chairman, XXIII ICCS Symposium on Multiple Metal-Ligand Bonds, 1984.
 Chairman, ACS Symposium on Unsaturated Metal-Carbon Bonds, Kansas City, 1982.
 Chairman, Microsymposium, "Catalytic Reactions in Chemical Synthesis", MIT, 1979.
 Chairman, ACS Zeise Sesquicentennial Symposium, New Orleans, 1976.

Named Lectures, Visiting Lectureships, Professorships

2019 Hillhouse Lecture, University of Chicago
 Chisholm Lecture, Ohio State University
 Howard Nobel Lecturer, University of New South Wales, Sydney

2018 Shine Lectures, Texas Tech University

2017 Nelson Lecture, University of Miami
 Michael Baird Lecture, Queen's University

2016 Provost's Distinguished Lecture, San Diego State

2015 Musselman Lecturer, Gettysburg College
 Solvay Lectures, University of Brussels

2014 Venanzi Lectures, ETH Zurich
 Solvay Lectures, University of Brussels

2013 Rothchild Lecture, University of Rochester
 Newton Abraham Professor, Oxford
 Vilsmeier Lecture, Regensburg
 Emerson Center Lectureship Award, Emory
 R. Bruce King Lecture, University of Georgia
 Putcha Venkateswarlu Annual Memorial Lecture, Alabama A&M

2012 Burack Lecture, University of Vermont

2011 M. L. H. Green Lecture, Oxford University

2010 Arthur J. Carty Lecture, University of Waterloo

2009 Five College Lectureship, Massachusetts
 Michael P. Cava Inaugural Lecturer, University of Alabama
 Shipley Lecturer, Clarkson University

2008 Bohlmann Lecturer, University of Berlin
 John Hood Fellow, Auckland University

- Siedle Lecture, Indiana University
- 2007 Inaugural Bio21 Lecturer, University of Melbourne
Birch Lecturer, Australian National University, Canberra
Closs Lecturer, University of Chicago
University Lecturer, Boston College
- 2006 Chancellor's Distinguished Lecture, University of California, Riverside
Hassell Lecture, University of Oslo, Norway
Walton Lecture, Purdue University
G. N. Lewis Lecture, University of California, Berkeley
H. Martin Friedman Lecture, Brooklyn College CUNY
- 2005 A. R. Gordon Lecturer, University of Toronto
Swift Lecturer, Caltech
Frankland Prize Lecturer, Royal Society of Chemistry
- 2004 Merck Lecture, Bristol Synthesis meeting
Cady Lectures, University of Washington
Thomas Chemistry Scholars Lecturer, University of Missouri at Columbia
Dreyfus Lecturer, Dartmouth College
- 2003 Kohler Lecturer, University of California, Riverside
Davis Memorial Lecture, University of New Orleans
- 2002 Royal Society of Chemistry Geoffrey Wilkinson Lecturer and Medalist
Novartis Lecturer, Boston College
H. B. Jonassen Lecturer, Tulane University
- 2001 Karabatsos Lecturer, Michigan State
- 2000 Closs Lecturer, University of Chicago
- 1999 Hoffman Lecturer, Imperial College
van der Kerk Lecturer, Utrecht
- 1997 Bayer Lectures, University of Pittsburgh
Milkowitch Lecture, University of Akron
Patrick Lectureship, Kansas State University
- 1996 H. C. Brown Lecture, Purdue University
Muetterties Lecturer, University of California, Berkeley
Grace Lecturer, University of Maryland
- 1995 Humphrey Memorial Lecturer, University of Vermont
Abbot Colloquium Lecturer, Northern Illinois University
DuPont Distinguished Seminar in Inorganic Chemistry, Indiana University
Cruikshank Lecture, Organometallic Gordon Research Conference
- 1994 Dow Lecturer, University of Ottawa
Pratt Lecture, University of Virginia
- 1993 Lee Lecturer, University of Chicago
Chute Lectureship, Dalhousie University
BASF Guest Professor, Kaiserslautern
- 1992 Robert A. Welch Lecturer
Distinguished Summer Lecturer, Northwestern University
- 1991 Royal Society of Chemistry Centenary Lecturer and Medalist
- 1990 Visiting Lecturer, University of Strasbourg
Visiting Lecturer, University of Rennes
- 1989 Boomer Lecturer, University of Alberta, Edmonton
BF Goodrich Lecturer, Case Western Reserve
- 1988 Special Lecturer, Festkolloquium für E. O. Fischer, Munich

- 1986 Sherman T. Fairchild Distinguished Scholar, California Institute of Technology
Ray Q. Brewster Memorial Lecturer, University of Kansas
- 1984 Peter A. Leermakers Distinguished Lecturer, Wesleyan University
- 1983 Distinguished Lecturer, University of Toronto
- 1982 Distinguished Lecturer, University of Guelph
- 1979 Visiting Lecturer, University of Texas

Plenary and Keynote Lectures

- 2016 Plenary Lecturer, XXXII ICCC, Brest
Plenary Lecturer, 6th EuChE MS Conference, Sevilla
- 2015 Keynote Lecturer, XXI International Symposium on Olefin Metathesis, Graz
- 2013 Keynote Lecturer, XX International Symposium on Olefin Metathesis, Nara
- 2011 Keynote Lecturer, XIX International Symposium on Olefin Metathesis, Rennes
- 2010 Plenary Lecturer, 24th International Conference on Organometallic Chemistry, Tapei
- 2009 Plenary Lecturer, International Conference on Organometallic Chemistry in Organic Synthesis, Glasgow
Keynote Lecturer, XVIII EuChE MS Conference on Organometallic Chemistry, Goteborg
Keynote Lecturer, International Symposium on Olefin Metathesis, Leipzig
- 2008 International Conference on Catalysis, Seoul
International Conference on Homogeneous Catalysis, Florence
International Conference on Coordination Chemistry, Jerusalem
- 2007 Plenary Lecturer, Australian Inorganic Chemistry Conference, Hobart
Keynote Lecturer, International Symposium on Olefin Metathesis, Pasadena
- 2005 Keynote Lecturer, International Symposium on Olefin Metathesis, XVI, Poznan
Plenary Lecturer, Eurochem 2005
- 2004 Keynote Lecturer, International Symposium on Homogeneous Catalysis, Munich
Plenary Lecturer, XXI International Conference on Organometallic Chemistry, UBC
Plenary Lecturer, Israeli Chemical Society, Tel Aviv
- 2003 Keynote Lecturer, International Symposium on Olefin Metathesis, XV, Kyoto
- 2002 Plenary Lecturer, Belgian Organic Synthesis Symposium (BOSS)
- 2000 Keynote Lecturer, International Symposium on Homogeneous Catalysis, Stockholm
- 1996 Plenary Lecturer, 31st ICCC, University of British Columbia, Vancouver
- 1995 Inorganic '95, University of Natal, Pietermaritzburg, South Africa
Cruickshank Lecturer in the Chemical Sciences, Organometallic Gordon Conference
- 1993 Royal Society Plenary Lecturer, London
Plenary Lecturer, Organometallic Chemistry in Organic Synthesis, Kobe
- 1992 Keynote Lecturer, International Symposium on Homogeneous Catalysis, Amsterdam

Patents

"Cyclooctatetraene Complexes of Niobium and Tantalum", U.S. 3,932,477, Jan. 13, 1976;
Richard R. Schrock, E.I. du Pont de Nemours & Co.

"Hydrocarbylidene Compounds of Niobium and Tantalum", U.S. 3,988,332, Oct. 26, 1976;
Richard R. Schrock, E.I. du Pont de Nemours & Co.

- "Synthesis of Ethylenically Unsaturated Compounds from Esters or Amides", U.S. 4,021,429, May 3, 1977; Richard R. Schrock, E.I. du Pont de Nemours & Co.
- "Tantalum Catalysts or Catalyst Precursors", U.S. 4,197,419, April 8, 1980; Richard R. Schrock, Massachusetts Institute of Technology.
- "Tantalum and Niobium Catalysts or Catalyst Precursors", U.S. 4,231,947, Nov. 4, 1980; Richard R. Schrock, Massachusetts Institute of Technology.
- "Dimerization of Olefins Using Tantalum and Niobium Catalysts", U.S. 4,245,131, Jan. 13, 1981; Richard R. Schrock, Massachusetts Institute of Technology.
- "Catalyst Composition to Effect Metathesis of Acetylenes", U.S. 4,427,595, Jan. 24, 1984; Richard R. Schrock, Massachusetts Institute of Technology.
- "Catalyst Composition for Effecting Metathesis of Olefins", U.S. 4,727,215, Feb. 23, 1988; Richard R. Schrock, Massachusetts Institute of Technology.
- "Homogeneous Rhenium Catalysts for Metathesis of Olefins", U.S. 5,087,710, Feb. 11, 1992; Richard R. Schrock and Robert Toreki, Massachusetts Institute of Technology.
- "Synthesis of Molybdenum and Tungsten Complexes", U.S. 5,142,073, August 25, 1992. Richard R. Schrock and Harold Fox, MIT, and Brian L. Goodall, B.F. Goodrich Company.
- "Living Olefin Polymerization Processes," U.S. 5,889,128, March 30, 1999. Richard R. Schrock and Robert Baumann, Massachusetts Institute of Technology.
- "Asymmetric Ring-Closing Metathesis Reactions," U.S. 6,121,473, September 19, 2000. Richard R. Schrock and John B. Alexander, Massachusetts Institute of Technology.
- "Asymmetric Ring-Closing Metathesis Reactions Involving Achiral and Meso Substrates," U.S. 6,346,652 B1, February 12, 2002. Richard R. Schrock, MIT, and Amir Hoveyda, Boston College.
- "Asymmetric Ring-Closing Metathesis Reactions," Eur. 1056756, September 1, 2004. Richard R. Schrock and John B. Alexander, Massachusetts Institute of Technology.

Students Receiving a Ph.D. Under the Direction of RRS

2015	Hyangsoo Jeong (#83) Jonathan Axtell	1993	Darryl Williams Jennifer (Robbins) Wolf Christopher C. Cummins (#40)
2014	Erik Townsend		John Oskam
2013	Laura Gerber (#80)		Howie Fox
2012	Alejandro Lichtscheidl	1992	Michael G. Vale
2011	Brian Hanna Smaranda Marinescu Margaret Flook	1991	Marie B. O'Regan Lee Y. Park Timothy E. Glassman
2010	Jiamin Chin Keith Wampler Annie (Jiang) King	1990	Robert Toreki Ira A. Weinstock Guillermo C. Bazan
2008	Rojendra Singh		Mark H. Schofield
2007	Andrea Gabert Tatiana Pilyugina (#70) Zachary Tonzetich Adam S. Hock	1989	Kimo B. Yap Jerald Feldman Richard Kolodziej
2006	Nathan Smythe Amritanshu Sinha Walter W. Weare	1988	John F. Buzinkai Andy H. Liu John S. Murdzek Kevin C. Wallace Steven A. Krouse
2005	Lourdes Pia H. Lopez Jennifer Adamchuk	1986	John Freudenberger
2004	Sarah Dolman	1985	Lauren Blum (#20) Mark L. Listemann Robert C. Murray
2003	Peter W. C. Tsang	1984	Laughlin G. McCullough
2002	Jennifer Jamieson (#60) Frank Cochran Parisa Mehrkhodavandi	1983	D. Scott Edwards Steven J. Holmes Steven F. Pedersen
2001	Yann Schrodi	1982	José Sancho Lynda G. Sturgeoff Howard W. Turner Scott M. Rocklage
2000	George Greco	1981	Patricia A. Belmonte Jeffrey H. Wengrovius
1999	Tom Boyd Lan-Chang Liang John Alexander	1980	Jere D. Fellmann Paul R. Sharp
1998	Myra O'Donoghue Steve Reid Robert Baumann (#50)	1979	David N. Clark Stephen J. McLain (deceased) Louis W. Messerle Gregory A. Rupprecht (deceased) Clayton D. Wood
1997	Timothy Warren Florian Schattenmann Scott Seidel		
1996	Gino G. Lavoie Joel S. Freundlich		
1995	Jin-Kyu Lee Anne LaPointe		

UROPS Mike Beachy (1990), Elisa Calamano(2002), Jay Chang (1993), Paul, Chow (1988), Chris Feger (1990), Howie Fox (1988), John Gavenonis (1998), Laura Goetting (1995), Bob Jarvis (1988), Jenny Lee, (1992), Garrett Leskowitz (1987), Brad Lichtenstein (1992), Beatrice Lin (1993), Shirley Lin (1995), Connie Lu (2006), Maria Manzoni (1998), Jean-Pierre Masson (1995), Jake Parrott (1995), Chris Pappas (1986), Christophe Pellet (1991), Jacqueline Pilot (1995), Alexander Popa (1998), Byeonghyeok Sohn (1997), Laura Turculet (1998), Thomas Wilhelm (1993)

Postdoctoral Students Under the Direction of RRS

Bhaskar Paul	10/19-	Deryn Fogg	5/95-4/97
Jordan Taylor	6/19-	Celine Rosenberger	3/94-4/96
Hosein Tafazolian	1/18-6/19	Yves Geerts	12/94-9/95
Tao Yan	11/17-4/19	Michael Buchmeiser(50)	1/94-12/94
Anne Hickey (110)	7/17-2/19	Brigitte Neuner	5/94-7/95
Feng Zhai	7/17-	Dan Dobbs	4/94-3/96
Melanie Lui	3/17-8/17	Karen Totland	12/93-4/96
Sudarsan VenkatRamani	1/17-6/19	Hirofumi Tohma	9/93-9/94
Jake Przyowski	10/16-7/17	Kotohiro Nomura	8/93-8/95
Congqin Zhu	1/16-10/16	Rusty Blanski	7/93-6/95
Grace Jang	1/16-3/17	Nadia Zanetti	7/93-6/96
Konstantin Bukhryakov	12/15-5/18	Shifang Luo	6/93-6/95
Lasantha Wickramasinghe	6/15-1/19	Keng-Yu Shih	11/9/92-11/9/94
Takaya Ogawa	6/15-3/17	Richard Tassoni (40)	11/92-11/93
Jeremy Krogman (100)	6/15-9/16	Rhett Kempe	11/92-10/93
Jonathan Lam	10/14-6/17	Andreas Grohmann	9/92-11/93
Peter Sues	8/14-12/16	Richard O'Dell	2/92-6/93
Jeremy John	1/14-2/17	David McConville	12/91-5/93
Benjamin Autenrieth	11/13-7/15	Moshe Kol	10/91-10/93
Jakub Hyvl	9/13-8/15	Gretchen Hofmeister	5/91-6/93
Will Forrest	11/12-6/14	Alan Vaughan	5/91-4/93
Graham Dobereiner	1/12-6/14	You-Ping Chan	11/90-6/92
Matthew Cain	1/12-6/14	Coleen Pugh	11/90-12/91
Stephan Kilyanek	9/10-7/13	Shiang Cai	10/90-9/92
Dima Peryshkov (90)	1/11-6/13	Zen Komiya	9/90-8/92
Jana Boerner	9/10-2/12	Tadahiro Sunaga	10/90-7/92
Travis Hebden	1/10-5/12	Amjad Farooq	12/89-3/91
Thiru Munisamy	1/10-1/11	Terrence Kee	3/89-8/90
Victor L. W. Ng	10/09-9/11	Hyun-Nam Cho	11/88-7/89
Jian Yuan	9/09-2/13	Jens Anhaus	10/88-10/89
Michael Reithofer	9/08-9/10	Rüger Schlund	9/88-4/89
Yu Zhao	6/08-6/11	Marcello DiMare	8/88-7/90
Thomas Kupfer	6/08-6/09	John S. Murdzek	6/88-12/88
Brad Bailey	6/07-6/09	William E. Crowe	3/88-5/90
Dennis Hettterscheid(80)	12/06-12/08	Konrad Knoll	1/87-2/89
Thorsten Kreckman	10/06-9/07	Dominic Yang	8/86-6/88
Corina Scriban	7/06-8/08	William Finch	7/86-9/87
Stephan Arndt	6/05-4/07	Helmut Sitzmann	2/86-6/87
Constantin Czekelius	11/04-8/06	Andrew Horton	1/86-7/87
Xuliang Dai	6/04-4/06	Randall DePue	12/85-6/87
Matt Byrnes	8/03-3/05	Larry Sita	11/85-12/86
Monica Duval	12/02-8/04	Marcel Wesolek	10/85-9/86
Frederic Pezet	1/02-1/03	Eric Walborsky	10/84-9/86
Vincent Ritleng	10/01-5/03	Colin Schaverien	10/84-10/85
Dimitry Yandulov (70)	8/00-6/04	Ian Latham	10/84-12/85
Klaus Ruhland	3/00-3/02	Jun Okuda	10/84-1/86
Steve Miller	1/00-7/01	Eckehart Roland	12/83-12/84
Samuel Dagherne	9/99-8/00	Heinz Strutz	11/83-11/84
Kai Hultsch	6/99-7/01	David A. Wigley	10/83-10/84
Pete Bonitatebus	6/99-2/01	Shane McLaughlin	9/83-9/85
Jonathan Goodman	1/99-5/01	Klaus H. Theopold	9/82-9/83

Denyce Wicht	1/99-6/00	Irene Feinstein-Jaffe	6/82-6/84
Arturo Casado	11/98-11/99	F. G. N. Cloke	9/81-9/82
Sherry Zhu	9/97-9/99	D. Astruc	1978
Miguel A. Flores (60)	10/97-12/99		
Rüdiger Stumpf	1/98-1/99		
Alexander Kolchinski	10/97-9/98		
David Graf	1/97-6/98		
Michael Aizenberg	12/96-6/98		
Klaus Wanninger	2/96-2/97		
Jesse Lee	6/95-1/97		

Publications of R. R. Schrock**Through 1973**

1. "Rate Constant Ratios During Nitrogen Dioxide Photolysis"
Schuck, E. A.; Stevens, E. R.; Schrock, R. R. *J. Air Pollution Cont. Assoc.* **1966**, *16*, 695.
2. "The Detection of Ethylketen and enol-Crotonaldehyde in the Vapour-phase Photolysis of *trans*-Crotonaldehyde"
Coomber, J. W.; Pitts, J. N. Jr.; Schrock, R. R. *Chem. Commun.* **1968**, 190.
3. "Preparation and Catalytic Properties of Some Cationic Iridium(III) and Rhodium(III) Dihydrido Complexes"
Shapley, J. R.; Schrock, R. R.; Osborn, J. A. *J. Am. Chem. Soc.* **1969**, *91*, 2816.
4. "Rhodium Catalysts for the Homogeneous Hydrogenation of Ketones"
Schrock, R. R.; Osborn, J. A. *Chem. Commun.* **1970**, 567-568.
5. " π -Bonded Complexes of the Tetraphenylborate Ion with Rhodium(I) and Iridium(I)"
Schrock, R. R.; Osborn, J. A. *Inorg. Chem.* **1970**, *9*, 2339.
6. "Preparation and Properties of Some Cationic Complexes of Rhodium(I) and Rhodium(III)"
Schrock, R. R.; Osborn, J. A. *J. Am. Chem. Soc.* **1971**, *93*, 2397.
7. "Coordinatively Unsaturated Cationic Complexes of Rhodium(I), Iridium(I), Palladium(II), and Platinum(II). Generation, Synthetic Utility, and Some Catalytic Studies"
Schrock, R. R.; Osborn, J. A. *J. Am. Chem. Soc.* **1971**, *93*, 3089-3090.
8. "Preparation of Ruthenium(0) and Osmium(0) Cyclooctatetraene Complexes"
Schrock, R. R.; Lewis, J. *J. Am. Chem. Soc.* **1973**, *95*, 4102.

1974

9. "Reactivity of Co-ordinated Ligands. Part XVIII. Cationic Ruthenium(II) and Osmium(II) Complexes by Electrophilic Attack on a π -Allyl Ligand"
Schrock, R. R.; Johnson, B. F. G.; Lewis, J. *J. Chem. Soc. Dalton*, **1974**, 951.
10. "Pentamethyl Complexes of Niobium and Tantalum"
Schrock, R. R.; Meakin, P. *J. Am. Chem. Soc.* **1974**, *96*, 5288.
11. "An 'Alkylcarbene' Complex of Tantalum by Intramolecular α -Hydrogen Abstraction"
Schrock, R. R. *J. Am. Chem. Soc.* **1974**, *96*, 6796-6797.

1975

12. "A Tantalum Carbyne Complex"
Guggenberger, L. J.; Schrock, R. R. *J. Am. Chem. Soc.* **1975**, *97*, 2935.
13. "The First Isolable Transition Metal Methylene Complex and Analogs. Characterization, Mode of Decomposition, and Some Simple Reactions"
Schrock, R. R. *J. Am. Chem. Soc.* **1975**, *97*, 6577-6578.
14. "Structure of Bis(cyclopentadienyl)methylmethylenetantalum and the Estimated Barrier to Rotation about the Tantalum-Methylene Bond"
Schrock, R. R.; Guggenberger, L. J. *J. Am. Chem. Soc.* **1975**, *97*, 6578-6579.
15. "Preparation and Structure of Tetraphenylarsonium Tricyclooctatetraeneniobium, [As(C₆H₅)₄][Nb(C₈H₈)₃]"
Guggenberger, L. J.; Schrock, R. R. *J. Am. Chem. Soc.* **1975**, *97*, 6693.

1976

16. "Cyclooctatetraene Complexes of Niobium and Tantalum and the Structure of Nb(η^4 -C₈H₈)[η^5 -C₈H₈(C₆H₅)][[(CH₃)₂AsC₆H₄As(CH₃)₂]"
Schrock, R. R.; Guggenberger, L. J.; English, A. D. *J. Am. Chem. Soc.* **1976**, *98*, 903-913.
17. " σ -Alkyl and -Aryl Complexes of the Group 4-7 Transition Metals"
Schrock, R. R.; Parshall, G. W. *Chem. Rev.* **1976**, *76*, 243.
18. "Catalytic Hydrogenation Using Cationic Rhodium Complexes. I. Evolution of the Catalytic System and the Hydrogenation of Olefins"
Schrock, R. R.; Osborn, J. A. *J. Am. Chem. Soc.* **1976**, *98*, 2134.
19. "Catalytic Hydrogenation Using Cationic Rhodium Complexes. II. The Selective Hydrogenation of Alkynes to Cis Olefins"
Schrock, R. R.; Osborn, J. A. *J. Am. Chem. Soc.* **1976**, *98*, 2143.
20. "Catalytic Hydrogenation Using Cationic Rhodium Complexes. III. The Selective Hydrogenation of Dienes to Monoenes"
Schrock, R. R.; Osborn, J. A. *J. Am. Chem. Soc.* **1976**, *98*, 4450.
21. "Multiple Metal-Carbon Bonds. 5. The Reaction of Niobium and Tantalum Neopentylidene Complexes with the Carbonyl Function"
Schrock, R. R. *J. Am. Chem. Soc.* **1976**, *98*, 5399.

22. "The Preparation of $\text{NbH}_5(\text{Me}_2\text{PCH}_2\text{CH}_2\text{PMe}_2)_2$ and $\text{NbHL}_2(\text{Me}_2\text{PCH}_2\text{CH}_2\text{PMe}_2)_2$ ($\text{L} = \text{CO}$ or C_2H_4)"
Schrock, R. R. *J. Organometal. Chem.* **1976**, 121, 373.
23. "Preparation and Characterization of $\text{M}(\text{CH}_3)_5$ ($\text{M} = \text{Nb}$ or Ta) and $\text{Ta}(\text{CH}_2\text{C}_6\text{H}_5)_5$ and Evidence for Decomposition by α -Hydrogen Atom Abstraction"
Schrock, R. R. *J. Organometal. Chem.* **1976**, 122, 209.

1977

24. "Multiple Metal-Carbon Bonds. 6. The Reaction of Niobium and Tantalum Neopentylidene Complexes with Simple Olefins: A Route to Metallocyclopentanes"
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