

March 2011

Resume

ROYCE W. MURRAY

Kenan Professor of Chemistry

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EDUCATION

B. S. Chemistry, Birmingham Southern College, 1957

Ph. D. Northwestern University 1960

PROFESSIONAL POSITIONS

1960 Instructor

1961 Assistant Professor

1966 Associate Professor

1969 Professor of Chemistry

1980- Kenan Professor

1996- Kenan Professor of Applied and Materials Sciences

HONORS

Alfred P. Sloan Research Fellow, 1969-72

Japanese Society for Promotion of Science Research Fellow, 1978

John Simon Guggenheim Fellow, 1980-1981

Distinguished North Carolina Chemist Award of the NC Institute of Chemists, 1987

Fellow, American Institute of Chemists, 1986

The Electrochemical Society Carl Wagner Memorial Award, 1987

Charles N. Reilley Award of Society for Electroanalytical Chemistry, 1988

Electrochemical Group Medal (Faraday Medal) of the Royal Society of Chemistry, London, 1989

Eleventh North Carolina ACS Section Distinguished Speaker Award, 1989

ACS Division of Analytical Chemistry Award in Electrochemistry, 1990

ACS Award in Analytical Chemistry, 1991 (Fisher Award)

Member, National Academy of Sciences, elected 1991

Fellow, American Academy of Arts and Sciences, elected 1992

Fellow, American Association for the Advancement of Science, elected 1992

Fellow, The Electrochemical Society, elected 1995

Eastern Analytical Symposium Award in the Fields of Analytical Chemistry, 1995

Breyer Medal, Electrochemistry Division, Royal Australian Chemical Institute, 1997

Olin Palladium Medal, The Electrochemical Society, 1997

Thomas Jefferson Award, University of North Carolina, Chapel Hill, NC 2001

A Festschrift Issue of the Journal of Physical Chemistry B, honoring 65th birthday 2001

Member of the International Advisory Board of IUPAC International Congress on Analytical Sciences 2001

North Carolina Award in Science (Governor's Award) 2001

National Associate of the National Academies (U.S.) 2001

Pittsburgh Award in Analytical Chemistry, Pittsburgh Society of Analytical Chemists, 2002.

Ralph and Helen Oesper Award, University of Cincinnati, 2002

Luigi Galvani Medal of the Italian Chemical Society, 2004

Centenary Lecturer of The Royal Society of Chemistry, U.K. 2005, An Award (Medal)

Southern Chemist Award, Memphis TN "Steps Along the Way Here, and The Now" December 9, 2008

2010 ACS Division of Analytical Chemistry Award for Distinguished Service in the Advancement of Analytical Chemistry, 240th ACS National Meeting 08/22/10.

2010 Building dedication: Murray Hall, Dept. of Chemistry, UNC

2010 ACS Division of Analytical Chemistry Award for Distinguished Service in the Advancement for Analytical Chemistry

2011 Reception at Pittcon to honor service as Editor-in-Chief of Analytical Chemistry. Retiring December 2011

Selected Lectureships:

Sherwin Williams Lecturer, University of Illinois, 1978
Distinguished Lecture Series, University of Denver, 1980
Distinguished Visiting Lecturer, University of Texas, 1981
Kilpatrick Lecture, Illinois Institute of Technology, 1982
Plenary Lecture, Pittsburgh Conference in Analytical Chemistry, 1983
Distinguished Visiting Professor, Texas A&M University, 1983
Samuel M. McElvain Lecturer, University of Wisconsin, 1985, 1994
Distinguished Summer Lectureship in Analytical Chemistry, Northwestern Univ., 1985
Welch Foundation Conference Lecturer, 1986
Plenary Lecturer, Internatl. Congress on Membranes, Membrane Society, Tokyo, 1987
Keynote Address, International Society for Electrochemistry, 38th Mtg, Maastricht, 1988
DuPont Distinguished Lecturer, Indiana University, 1988
Elving Lecture, Univ. of Michigan, 1989
Warner Lecture, Univ. of Kansas, 1989
Keynote Address, International Society for Electrochemistry, Kyoto, 1989
Electrochemistry Group Medal Award Lecture, Faraday Division of the Royal Society of Chemistry, Oxford, 1989
Coates Lecture, University of Wyoming, 1990
College of Science Lecture Series, University of Notre Dame, 1991
Plenary Lecture, Fischer Symposium, Karlsruhe, Germany, 1991
Rosenblatt Memorial Lecture, Northeastern University, Boston, MA, 1992
Musselman Lecture Series, Gettysburg, PA, 1992
Boomer Lectures, Edmonton, Canada, 1992
Donald Davis Memorial Lecture, Univ. of New Orleans, 1993
Fifteen Gordon Research Conference Lectures, at Analytical, Electrochemical, Inorganic, Solid State Ionics, Electronic Materials, Organic Films, Donor/Acceptor
Plenary Lecture 6th International Fischer Symp. on Nanotechniques in Electrochemistry, Karlsruhe, Germany, 1994
Marker Lectures, Penn State University, 1995
UNC Department of Chemistry Short Course Banquet Lecture March, 1995
Analytical Chemistry Gordon Research Conference, New Hampton, NH, 1995
Centennial Lecturer, University of Texas, 1995
James Robinson Adventures Symposium, Univ. of Louisiana, 1995
Research Frontiers in Chemical Materials, (3 lectures) University of Iowa, 1995
DuPont Distinguished Lecture, Indiana University, 1997
Award Address for receiving Olin Palladium Medal of The Electrochemical Society, Joint International Meeting of The Electrochemical Society and the International Society for Electrochemistry (largest electrochemical conference in history), Paris, France, August 31, 1997.
Keynote Address, International Ion Chromatography Symposium, 1997
Frontier of Chemistry Lectures, University of Florida 1998
Frontiers in Chemistry Seminar, Case Western Reserve University 1998
Gordon Research Conference on Electrochemistry, Ventura, CA, 1998
Gordon Research Conference on Donors and Acceptors, 1998
Powell Lecture, University of Richmond, 1999
Ritter Lectures, Miami University (Ohio) 1999
Plenary Lecture, Australian International Symposium on Analytical Science, Melbourne, Australia 1999
Plenary Lecture, I. M. Kolthoff Lecture, European Soc. Electroanalyt. Chem., Bonn, Germany 6-2000
Keynote Lecture, International Symposium on Prospects of Bioelectrochemistry in the 21st Century, Kyoto, Japan, 3-2000
Plenary Lecture, International Society for Electrochemistry, Warsaw, Poland, 9-2000
Plenary Lecture, Meeting of Royal Society of Chemistry Electrochemistry Group, Dublin, Ireland, 9-2000
Plenary lecture, Summer Undergraduate Research Program (SURP) at Clemson University 7-2001.

Frederick Lee Conover Lecture, Vanderbilt University, 10-2001.
Lyle Dawson Lecture, University of Kentucky, 2002
Ralph and Helen Oesper Lecture, University of Cincinnati, 2002
G. Frederick Smith Memorial Lectures, University of Illinois, 2002
Ernest H. Swift Lecture, California Institute of Technology, 2003
Meeting of the Electrochemistry Division of the Italian Chemical Society Padova Italy, September 2004
(*Giornate dell'Elettrochimica Italiana 2004* (GEI2004))
Lind lectures at University of TN and ORNL October, 2004
Reilley Award Symposium, Pittcon Orlando, FL March 2005
Joel Broberg Lectures, University of North Dakota, April 2005
Lipscomb Lecture, University of South Carolina, Columbia, SC April 2005
Van Duyne Symposium, Northwestern October 14, 2005
Centenary Lecturer (Stanley Langer), United Kingdom November 2005
Adams Award Symposium, 2006 Pittcon, Orlando, FL, March 2006
Georgetown University, May 5, 2005.
Northwestern University, Richard Van Duyne Symposium, October 15, 2005.
The University of Warwick, University of Bristol, University of Liverpool, University of Southampton,
University of Belfast, University of Glasgow, Scotland (as the RSC Centenary Lecturer), November 2005
University of Victoria, Simon Fraser University, April, 2006
Velmer A. Fassel Lecture Series, Iowa State University, May 15, 2006 – May 17, 2006.
Symposium on Nanoparticles, Electrons, and Photons, Division of Organic and Biological
Electrochemistry, Joint International Meeting of The Electrochemical Society and the XXI Congreso de la
Sociedad Mexicana de Electroquímica, Cancun, Mexico, Oct. 29-Nov 3, 2006.
Symposium on Analytical Characterization of Nanoparticles and Nanomaterials, Pittcon07, Chicago, IL,
Feb. 25-Mar. 1, 2007
University of Texas at Arlington March 23, 2007,
Kolthoff Lectures, University of Minnesota, September 26 – 29, 2006.
Pittsburgh Conference Achievement Award Symposium, Pittcon07, Chicago, IL, Feb. 25-Mar. 1, 2007
Distinguished Lecturer Series for 2007 Derby Lectures at University of Kentucky May 7 and 8, 2007
Plenary Lecture, 2nd International Congress on Ionic Liquids (COIL-2), Yokohama, Japan, August 6, 2007.
Georgia Institute of Technology Emerson Lecturer October 2, 2007
Shain Lecture Seminar, University of Wisconsin-Madison, October 18-20, 2007
International Symposium on monolayer-protected AU clusters (ISMPC08) Jyväskylä, Finland, September
12-13, 2008
Southern Chemist Award, Memphis, TN December 9, 2008
Plenary speaker at the EChem Zing Electrochemistry Conference, Playa del Carmen Mexico, Feb 8-11,
2009
Lee Lecture, UC Irvine, May 27, 2009
Dasgupta Endowed Lecture Texas Tech University, Dept. of Chemistry and Biochemistry, Nov. 18, 2009
Osteryoung Symposium at the 13th International Conference on Electroanalysis, Gijón, Spain June 21, 2010
Van Duyne Symposium at the 24th ACS National Meeting, Boston, MA August 23, 2010
The Murray 50th Symposium, A Half-Century at the Crossroads of Chemistry, at the ACS National Meeting,
Boston, MA August 21, 2010
Zhang Symposium, Pittcon 2011 Atlanta GA
Distinguished Speaker Seminar, University of Maryland, Department of Chemistry and Biochemistry,
April 14-16, 2011

Research Grant Support:

Research Corporation
Air Force Office of Scientific Research
Alfred P. Sloan Foundation
Advanced Research Projects Agency
Chevron Corporation
Lord Corporation
North Carolina Board of Science and Technology
North Carolina Biotechnology Center

National Science Foundation (present)
Office of Naval Research (present)
Department of Energy (present)
NASA
UNC Energy Frontier Research Center (EFRC)

Also previous Conference grants from:

Army Research Office, Durham, NC
Air Force Office of Scientific Research
National Science Foundation
Petroleum Research Foundation

SERVICE, UNC

- *Building Committee Chair, construction of Kenan Laboratories of Chemistry, 1967-71
- *Acting Chair, Department of Chemistry, 1970-71
- *Vice Chair, Department of Chemistry, 1972-75
- *Director of Undergraduate Studies, Department of Chemistry, 1978-80
- *Department Chair, 1980-85
- *Vice Chair, Division of Natural Sciences, 1985-87
- *Chair, of Search Committees (for Chair UNC Dept. of Phys. Ed., for Assoc. Vice-Chancellor Graduate School, for Vice Chancellor Business and Finance (1989-90), for Provost (1991-92))
- *Chair, Division of Basic and Applied Natural Sciences, 1987-93
- *Chair, Curriculum in Applied and Materials Sciences, 1995-98
- *Vice Chair, Division of Basic and Applied Natural Sciences, 1998-
- *Chair, Planning Team for Physical Sciences component of the Science Complex Project, 1998-
- *Undergraduate Admissions Committee (sub-committee on student recruitments) (1998 -)
- *Ad hoc Committee to review nominations for Packard Awards and Dreyfus New Faculty Awards, fall 1999.
- *Department of Chemistry, Committee on Development, Fall 1999-
- *Chair, Department of Chemistry, Chair Nominating Committee, Fall 1999
- *College of Arts and Sciences Conflict of Interest Review Committee, 1998-
- *Department of Chemistry, Chair, Committee on Awards, Fall 2000-
- *Department of Chemistry, Committee on Post Tenure Review, Fall 2000
- *Chair, Task Force for Planning and Construction of the \$200M Science Complex at UNC, 1999-2005
- *Chemistry Department External Advisory Board (2000-)
- *College of A&S task Force for Planning for Capital Improvements in the Interdisciplinary Physical Sciences (Science Complex Core Complex Spring 1998 – present, Chair 1998 - 2005)
- *College of Arts and Sciences, Science Advisory Committee (2001-present; committee has been inactive)
- *Chancellor's committee for review of Provost Shelton for reappointment. Feb – May, 2005.
- *Member UNC Energy Task Force (Chancellor appointment) 2010

SERVICE, NATIONAL

- *Nat. Sci. Found.: Program Director for Chemical Analysis, NSF (on leave from UNC), 1971-1972; National Advisory Panel for Division of Chemistry, 1973-77; Organized/Chaired National Energy Workshop on Electrochemistry, 1974; Review Team Consultant for In-Depth Evaluation of Program-Chemical Analysis, 1975, Chemical Instrumentation, 1976, Cross-Program Comparison, 1977.
- *Amer. Chem. Society: Subcomm. Graduate Level Analytical Chemistry Examination, Division of Chemical Education, 1964-74 (Chair, 1970-74); Division of Analytical Chemistry, ACS, Alternate Councilor, 1978-79, Councilor, 1980-82; Canvassing Committee, an ACS National Award (1984-86); Advisory Board, Analytical Chemistry (Journal), 1979-1981; Program Coordinator, Division of Analytical Chemistry, 1985-1989; Society Committee on Publications (1985-90); Executive Committee, Division of Analytical Chemistry, 1991-
- *Member, Board of Directors of Western Electroanalytical-Theoretical Society, 1963-71
- *Advising Editor for Analytical Chemistry, McGraw-Hill Encyclopedia and Yearbook of Science and Technology, 1966-1985

*Fulbright-Hayes Fellowships, Council for International Exchange of Scholars, Advisory Screening Committee in Chemistry, 1976-78

*Vice-Chairman, Chairman, Gordon Conference on Electrochemistry, 1977, 1978

*North Carolina Energy Institute, State Advisory Board, 1978-1983 (Governor's appointee)

*U.S. Army Scientific Research Office, Advisory Committee, 1978-81, Steering Committee, 1979-82

*Council for Chemical Research, Scientific Advisory Board, 1983-86

*Society of Electroanalytical Chemists, Board of Directors, 1984-86; President, 1991-92

*Southeastern Regional Scientific Liaison, Opportunities in Chemistry Report, 1985-89

*Air Force Office of Scientific Research, Chair, Chemistry Evaluation Panel, 1986-90

*Journal Editor, Analytical and Physical Chemistry Section of "Chemtracts", 1989-90

*IUPAC Commission on Electrochemistry, USA National Representative, 1985-89

*National Research Council, Materials Research Board, Study Committee on New Sensor Technologies, 1992-93; Board on Chemical Sciences and Technology, 1992-1994, Co-Chair, 1994-1997; Steering Committee for Challenges in Chemistry, 2000-; Member NRC Report Review Committee 2000-2006.

*Member, National Academy of Sciences (participate in confidential activities of the Academy)

*Member, American Academy of Arts and Sciences

*Review of research proposals for National Science Foundation (Divisions of Chemistry and of Materials Science), Department of Energy (Division of Basic Sciences), ACS Petroleum Research Fund, Research Corporation, various Canadian, Australian, U.K., Israeli Research Councils

*Reviewer of manuscripts for J. Amer. Chem. Soc., J. Phys. Chem., Inorg. Chem., J. Electrochem. Soc., Langmuir, Electrochim. Acta, J. Chem. Soc. Chem. Commun. (London), J. Coll. Interfac. Sci., Macromolecules, Wiley, Science, Nature, Advanced Materials, Chem. of Materials

*Member, Science Advisory Board, Cyran Sciences, Inc., Pasadena, CA, 1998-

*External review of Department of Chemistry for the Graduate School of the University of Washington, Seattle, WA, 1999

*Member of External Advisory Board for Beckman Institute, University of Illinois, 1999-present (meets biannually)

*Member, Science Advisory Board, Xanthon Corp, RTP, NC, 1999-2003

*Member, jury committee for 2001 Charles N. Reilley Award of the Society for Electroanalytical Chemistry.

*Member, jury committee for year 2000, 2002, 2004 H.E. Merck Award in Analytical Chemistry.

*Member, Report Review Committee of the National Research Council, Washington, DC, 2000-2005

*Member, jury committee for 2003 Charles N. Reilley Award of the Society for Electroanalytical Chemistry.

*Editor –in-Chief, Analytical Chemistry (1991 –December 2010, retired). This is the leading journal in the discipline. Approximately 2600 research manuscripts received annually and evaluated for publication by myself and eight Associate Editors. A Managing Editor and several full-time news and review staff at the journal's Washington office handle the A-Page section of the journal.

*Member, Committee of Visitors (COV) for the Chemical Sciences, Geosciences, and Biosciences Division in the DOE Office of Basic Energy Sciences, March 2005

*Chair of Chemistry Section of NAS (elected May 2005 to 2008) (The 170 member Chemistry Section is the largest in the Academy.)

*American Academy of Arts and Sciences, Class I, Membership Committee, Fall 2005.

*Participation in Graduate School Review of Department of Chemistry at the University of Utah Salt Lake City, UT Fall 2006.

* Chair of Chemistry Section of NAS (elected May 2005 to 2008) (The ~170 member Chemistry Section is the largest in the Academy.)

*Analytical Chemistry A-Page Panel meeting, at Pittcon 07, Chicago, IL, March 2, 2007.

*Analytical Chemistry Advisory Board Meeting, Washington, DC May 4 – 5 , 2007

*Annual Caucus (Chair) of Chemistry NAS members, at NAS Annual Meeting, Washington, DC April 30, 2007.

*Jury member for the HEM Award Ceremony at 14th Euroanalysis in Antwerp Belgium September 9-14, 2007

* Chair of External Review Committee for Department of Chemistry at the University of Michigan, Ann Arbor, MI, March 2008.

* Member of the International Advisory Board of IUPAC International Congress on Analytical Sciences 2011 (ICAS2011) Kyoto Japan May 23-26, 2011.

*Member of National Research Council Study, Committee on Effectiveness of National Biosurveillance Systems: BioWatch and the Public Health System (Bio-terrorism) June 2008-present.

*Member of National Research Council Study, Committee on the Department of Homeland Security, Science and Technology Directorate, August 2009-present

*Selected by ACS Editors as Chair of Council of Editors, 2010-2013

*Member of external review committee for Penn State Chemistry Dept. March 2010

*Member of ACS Governing Board for Publishing starting July 1, 2010

*Member of the External Advisory Board for Oak Ridge National Laboratory team in the Fluid Interface Reactions, Structures and Transport Energy Frontier Research Center. August 22, 2010

*Member of the CAPA (Chinese-American Chemistry & Chemical Biology Professors Association) advisory board

*Member of American Chemical Society Governing Board for Publishing, Spring 2010 –

*Jury member MERCK award for 3rd EuChemMS in Nuremberg, Germany

*NSF Proposal Review Panel

*External review member for the Chemistry Department, University of MD, Baltimore

Publications

458+ research articles, 4 patents, 4 books, and 176+ editorials (in Analytical Chemistry)

One of most highly cited chemists (top 250) worldwide during the period 1981-1999: see <http://isihighlycited.com/home.cgi>

Murray's "H Index" as of April 2010 is 92 (tied for 45th in list of top 100 living chemists worldwide).

Mentor:

75 Ph.D. and 17 Master's students, 60 Post-doctoral associates, 152 total; 45 hold or have held faculty appointments in colleges and universities

List of Publications: Royce W. Murray

1. **R. W. Murray** and C. N. Reilley, Chronopotentiometry with Current Programmed as a Function of Time. I. Constant Power Functions of Time, *J. Electroanal. Chem.* **1962**, *3*, 64.

2. **R. W. Murray** and C. N. Reilley, Chronopotentiometry with Programmed Current. II. Response Function Additivity Principles Applied to Current Programming and Multicomponent Systems, *J. Electroanal. Chem.* **1962**, *3*, 182.

R1. **R. W. Murray** and C. N. Reilley, Potentiometric Titrations (a review), *Anal. Chem.* **1962**, *34*, 313R.

R2. **R. W. Murray** and C. N. Reilley, Introduction to Electrochemical Techniques, in Treatise on Analytical Chemistry, Volume 4, Part I, I. M. Kolthoff and P. J. Elving, eds. Interscience Publishers, New York, 1963.

B1. **R. W. Murray** and C. N. Reilley, Electroanalytical Principles (paperback book reprint of the above, published separately), Interscience Publishers, New York, 1964.

3. **R. W. Murray**, Power of Time and Exponential Current Chronopotentiometry, *Anal. Chem.* **1963**, *35*, 1784.

R3. **R. W. Murray** and C. N. Reilley, Potentiometric Titrations, *Anal. Chem.* **1964**, *36*, 370R.

R4. Book Review of Comprehensive Analytical Chemistry, Volume IIA, C. L. Wilson and D. W. Wilson, eds., Elsevier Publishing Company, New York, 1964; *Anal. Chem.* **1964**, *12*, 62A.

4. **R. W. Murray**, The Use of Programmed Current Chronopotentiometry in Studies of Adsorption, *J. Electroanal. Chem.* **1964**, 7, 242.
- R5. D. J. Gross and **R. W. Murray**, Electroanalytical Methods, Encyclopedia of Chemical Technology, A. Standen, ed., Interscience Publishers, New York, 1964, 43 pp.
5. R. F. Broman and **R. W. Murray**, Chronopotentiometric Study of Phenylmercuric Ion Adsorption on a Mercury Electrode, *Anal. Chem.* **1965**, 37, 1408.
6. M. Kodama and **R. W. Murray**, Kinetic Control by Chemical Step at an Adsorption-Blocked Electrode Surface, *Anal. Chem.* **1965**, 37, 1638.
7. M. Kodama and **R. W. Murray**, Discriminating Effect of Adsorbed Asymmetric Film Electrode Toward Electroactive Metal Complex Enantiomers, *Anal. Chem.* **1965**, 37, 1759.
8. **R. W. Murray** and D. J. Gross, Chronopotentiometric and Chronocoulometric Measurements of Adsorption of Lead and Mercury(II) at Mercury Electrodes, *Anal. Chem.* **1966**, 38, 392.
9. D. J. Gross and **R. W. Murray**, Inhibition of Electrode Reactions by Adsorbed Lead Iodide, Bromide and Thiocyanate, *Anal. Chem.* **1966**, 38, 405.
10. R. C. Bowers and **R. W. Murray**, Voltammetric Membrane Electrode Study of the Ion-Exchange Properties of Cellophane Membranes, *Anal. Chem.* **1966**, 38, 461.
11. **R. W. Murray** and D. J. Gross, Spherical-, Shielding- and Streaming Effects in Current-Reversal Chronopotentiometry at the Hanging Mercury Drop Electrode, *J. Electroanal. Chem.* **1967**, 13, 132.
12. G. W. O'Dom and **R. W. Murray**, Instrument for Functional Readout of Chronocoulometric Data: Application to Cadmium Adsorption from Iodide Medium, *Anal. Chem.* **1967**, 39, 51.
13. **R. W. Murray** and R. J. Passarelli, Reversed-Phase Thin Layer and Column Chromatography with Alkyl Amine and Quaternary Ammonium Salt Stationary Phases, *Anal. Chem.* **1967**, 39, 282.
14. **R. W. Murray** and L. K. Hiller, Jr., Supporting Electrolyte Effects in Nonaqueous Electrochemistry: Coordinative Relaxation Reactions of Reduced Metal Acetylacetonates in Acetonitrile, *Anal. Chem.* **1967**, 39, 1221.
15. W. R. Heineman, G. W. O'Dom and **R. W. Murray**, An Optically Transparent Thin Layer Electrochemical Cell, *Anal. Chem.* **1967**, 39, 1666.
16. **R. W. Murray** and R. L. McNeely, Electrochemical Masking with an Adsorbed Metal Complex: Determination of Silver-Mercury Mixtures, *Anal. Chem.* **1968**, 39, 1661.
17. G. W. O'Dom and **R. W. Murray**, Chronocoulometric Measurement of Indium(III) Adsorption from Thiocyanate Medium, *J. Electroanal. Chem.* **1968**, 16, 327.
- R6. Book Review of Modern Methods of Chemical Analysis, R. L. Pecsok and L. D. Shields, eds., John Wiley and Sons, New York, 1968; *Anal. Chem.* **1968**, 40, 81A.
18. W. R. Heineman, J. N. Burnett and **R. W. Murray**, Optically Transparent Thin-Layer Electrodes: Studies of Iron(II)-(III) Acetylacetonate Ligand Exchange Reactions in Acetonitrile, *Anal. Chem.* **1968**, 40, 1970.
19. W. R. Heineman, J. N. Burnett and **R. W. Murray**, Optically Transparent Thin-Layer Electrodes: Ninhydrin Reduction in an Infrared Transparent Cell, *Anal. Chem.* **1968**, 40, 1974.

20. L. K. Hiller, Jr., J. R. Cockerell, Jr. and **R. W. Murray**, Dilithium Complexes of β -Diketones in Acetonitrile Solvent, *J. Inorg. Nuclear Chem.* **1969**, *31*, 765.
21. J. N. Burnett, L. K. Hiller, Jr. and **R. W. Murray**, Supporting Electrolyte Effects in Electrochemistry: Copper and Mercury Acetylacetonates in Acetonitrile Solvent, *J. Electrochem. Soc.* **1970**, *117*, 1028.
22. T. E. Neal and **R. W. Murray**, Autocatalysis of the Kinetic Wave of Acetylacetone in Acetonitrile Solvent, *Anal. Chem.* **1970**, *42*, 1654.
- R7. **R. W. Murray**, Chronoamperometry, Chronocoulometry and Chronopotentiometry, in Physical Methods of Organic Chemistry, Weissberger, ed., Wiley-Interscience, New York, 1971.
23. M. Petek, T. E. Neal and **R. W. Murray**, Spectroelectrochemistry - Applications of Optically Transparent Minigrad Electrodes under Semi-Infinite Diffusion Conditions, *Anal. Chem.* **1971**, *43*, 1069.
24. I. Piljac and **R. W. Murray**, Nonaqueous Electrochemistry of 1-Hydroxy-9,10-Anthraquinone and Its Conjugate Base, *J. Electrochem. Soc.* **1971**, *118*, 1758.
25. J. R. Cockerell and **R. W. Murray**, Deuterium Labeling by Electrochemical Reactions, *J. Electrochem. Soc.* **1972**, *119*, 849.
26. M. Petek, T. E. Neal, R. L. McNeely and **R. W. Murray**, Comparative Spectroelectrochemical, Stopped-Flow Kinetic and Polarographic Study of the Titanium(III)-Hydroxylamine Reaction, *Anal. Chem.* **1973**, *45*, 32.
27. C. M. Elliott and **R. W. Murray**, A Crystalline Bilayer Adsorbed on Mercury Electrode, *J. Am. Chem. Soc.* **1974**, *96*, 3321.
28. H. B. Herman, R. L. McNeely, P. Surana, C. M. Elliott and R. W. Murray, Surface Solubility and Reaction Inhibition in Lead Bromide and Iodide Adsorbed on Mercury Electrodes, *Anal. Chem.* **1974**, *46*, 1258.
29. R. M. Wightman, R. L. Scott, C. N. Reilley, J. N. Burnett and R. W. Murray, Computer Controlled Rapid Scanning Stop Flow Spectrometer, *Anal. Chem.* **1974**, *46*, 1492.
- R. O. Osteryoung and **R. W. Murray**, Report of the National Energy Workshop on Electrochemistry, Chapel Hill, North Carolina, July, 1974.
30. L. A. Simonson and **R. W. Murray**, On the Anodic Oxidation of Hydroxide Ion in Acetonitrile and Dimethyl Sulfoxide, *Anal. Chem.* **1975**, *47*, 290.
31. C. M. Elliott and **R. W. Murray**, Theory for Adsorption Re-equilibration in Reverse Step of Double Potential Step Chronocoulometry of Adsorbed Reactants, *Anal. Chem.* **1975**, *47*, 908.
32. T. R. Weaver, T. J. Meyer, S. A. Adeyemi, G. M. Brown, R. P. Eckberg, W. E. Hatfield, E. C. Johnson, **R. W. Murray** and D. Untereker, Chemically Significant Interactions Between Ruthenium Ions in Oxo-Bridged Complexes of Ruthenium(III), *J. Am. Chem. Soc.* **1975**, *97*, 3039. 33. P. R. Moses, L. M. Wier and **R. W. Murray**, A Chemically Modified Tin Oxide Electrode, *Anal. Chem.* **1975**, *47*, 1882.
34. R. M. Wightman, J. R. Cockerell, **R. W. Murray**, J. N. Burnett and S. B. Jones, Protonation Kinetics and Mechanism for 1,8-Dihydroxyanthraquinone and Anthraquinone Anion Radicals in Dimethylformamide Solvent, *J. Am. Chem. Soc.* **1976**, *98*, 2562.
35. C. M. Elliott and **R. W. Murray**, Thallium Bromide Adsorption and TwoDimensional Crystallization on Mercury Electrodes, *Anal. Chem.* **1976**, *48*, 259.

36. C. M. Elliott and **R. W. Murray**, Chemically Modified Carbon Electrodes, *Anal. Chem.* **1976**, *48*, 1247.
- B2. F. N. Collier, **R. W. Murray** and R. H. Kherlopian, Quantitative Laboratory Experiments for General Chemistry, Houghton Mifflin Company, Boston, 1976.
- Chemically Modified Electrodes, Chemical and Engineering News, July 19, 1976.
37. P. R. Moses and **R. W. Murray**, Chemically Modified Electrodes. III. SnO₂ and TiO₂ Electrodes Bearing an Electroactive Reagent, *J. Am. Chem. Soc.* **1976**, *98*, 7435.
38. B. Firth, L. L. Miller, M. Mitani, T. Rogers, J. C. Lennox and **R. W. Murray**, Anodic and Cathodic Reactions on a Chemically Modified Edge Surface of Graphite, *J. Am. Chem. Soc.* **1976**, *98*, 8271.
39. L. T. Mimms, M. A. McKnight and **R. W. Murray**, Spectrophotometric Study of Coverage and Acid-Base Equilibrium of a Chemically Bonded Base, *Anal. Chim. Acta* **1977**, *89*, 355.
40. D. F. Untereker, J. C. Lennox, L. M. Wier, P. R. Moses and **R. W. Murray**, Chemically Modified Electrodes. IV. Evidence for Formation of Monolayers of Bonded Organosilane Reagents, *J. Electroanal. Chem.* **1977**, *77*, 309.
41. D. G. Davis and **R. W. Murray**, Surface Electrochemistry of Iron Porphyrins and Iron on Tin Oxide Electrodes, *Anal. Chem.* **1977**, *49*, 194.
42. P. R. Moses and **R. W. Murray**, Chemically Modified Electrodes. V. Covalent Binding of a Reversible Electrode Reactant to RuO₂ Electrodes, *J. Electroanal. Chem.* **1977**, *77*, 393.
43. J. R. Lenhard and **R. W. Murray**, Chemically Modified Electrodes. VII. Covalent Bonding of a Reversible Electrode Reactant to Pt Electrodes Using an Organosilane Reagent, *J. Electroanal. Chem.* **1977**, *78*, 195.
44. J. C. Lennox and **R. W. Murray**, Chemically Modified Electrodes. VI. Binding and Reversible Electrochemistry of Tetra(Aminophenyl)Porphyrin on Glassy Carbon, *J. Electroanal. Chem.* **1977**, *78*, 395.
45. P. R. Moses, L. M. Wier, J. C. Lennox, H. O. Finklea, J. R. Lenhard and **R. W. Murray**, Chemically Modified Electrodes. IX. X-Ray Photoelectron Spectroscopy of Alkylaminesilanes Bound to Metal Oxide Electrodes, *Anal. Chem.* **1978**, *50*, 576.
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