CURRICULUM VITAE

Raymond C. Fort, Jr.

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Education

Undergraduate:	Drexel Institute of Technology; B.S. in Chemistry, *cum laude*, 1961; cooperative program
Graduate:	Princeton University; Ph.D. in Chemistry, 1965; dissertation director, Paul von R. Schleyer
Post-doctoral:	Princeton University, 1964-1965; supervised Professor Schleyer's group during his sabbatical

Awards and Fellowships

Alumni Association Distinguished Teaching Award, Kent State University, 1982

Finalist, College of Arts and Sciences Teaching Award, Kent State University, 1979, 1981

Finalist, Alumni Association Distinguished Teaching Award, Kent State University, 1968, 1971, 1980

National Science Foundation Predoctoral Fellow, Princeton University, 1963-1964

Allied Chemical Corporation Fellow, Princeton University, 1962-1963

Outstanding Scholar Award, Philadelphia Section, American Chemical Society, 1961

Honorary Societies

Phi Kappa Phi Sigma Xi

Experience

Professor of Chemistry, Department of Chemistry, University of Maine, 1991 -

Visiting Professor, Department of Chemistry, University of Washington, Seattle, WA, 1991 - 1992

Professor of Chemistry and Chairman, Department of Chemistry, University of Maine, July 1985 to August 1991

Assistant, Associate, Professor of Chemistry, Kent State University, September 1965 to July 1985

Visiting Associate Professor of Chemistry, University of Virginia, September 1974 to June 1975

Teaching Assistant, Princeton University, September 1961 to June 1962

Technical Specialist, Philadelphia Quartz Company, June to September 1961

Assistant Instructor, Drexel Institute of Technology, (co-op job), September 1960 to June 1961

Student Trainee (GS-5), Eastern Regional Laboratory, A.R.S., U.S.D.A. (co-op j ob), June to September 1960

Laboratory Technician, Philadelphia Electric Company Coke Oven Plant (co-op job), January to June, 1958 and 1959

Professional Societies

The American Chemical Society; The American Association for the Advancement of Science; The Protein Society

Publications

M. Nguyen, V. Makkena, J. Wyman, Renee' Whippee, B. J. W. Cole, and R. C. Fort Jr., "Oxidative Reactions of Aryl Glycosides as Models for Lignin-carbohydrate "Complexes". I. Reaction of Aryl Glycosides with Photochemically Generated Hydroxyl Radical", manuscript in preparation.

A. O'Farrill, M. Nguyen, B. J. W. Cole, and R. C. Fort Jr., "Enzymatic Oxidation of Lignin. I. Docking of Lignin Models with a Four-Copper Laccase", manuscript in preparation.

Thomas Elder and R. C. Fort Jr., "Reactivity of Lignin – Correlation with Molecular Orbital Calculations", in *Lignin and Lignans,* ed. C. Heitner, Taylor and Francis, Boca Raton, FL; in press

D. F. Guay, B. J. W. Cole, R. C. Fort, Jr., M. C. Hausman, J. M. Genco, and T. J. Elder, "Mechanisms of Oxidative Degradation of Carbohydrates During Oxygen Delignification. III. Reaction of Photochemically Generated Hydroxyl Radicals with 1,5-Anhydrocellobitol and Cellulose", J. Pulp Paper Sci., **2002,** *28,* 217.

T. Solouki, R. C. Fort, Jr., A. Alomary, and A. Fattahi, "Gas Phase Hydrogen-Deuterium Exchange Reactions of a Model Peptide: FT-ICR and Computational Analyses of Metal-Induced Conformational Mutations", *J. Am. Soc. Mass Spectr*., **2001**, *12*, 1272.

D. F. Guay, B. J. W. Cole, R. C. Fort, Jr., M. C. Hausman, J. M. Genco, T. J. Elder, and K. R. Overly, "Mechanisms of Oxidative Degradation of Carbohydrates During Oxygen Delignification. II. Reaction of Photochemically Generated Hydroxyl Radicals with Methyl β-D-cellobioside", *J. Wood Chem. Technol.,* **2001,** *21(1), 67*.

D. F. Guay, B. J. W. Cole, R. C. Fort, Jr., J. M. Genco, and M. C. Hausman, "Mechanisms of Oxidative Degradation of Carbohydrates During Oxygen Delignification. I. Reaction of Photochemically Generated Hydroxyl Radicals with Methyl β-D-glucoside", *J. Wood Chem. Technol.,* **2000,** *20(4)*, 375.

B. J. W. Cole, J. Yang, and R. C. Fort, Jr. "The Bleaching and Photostabilization of High-Yield Pulp by Sulfur Compounds. II. Reaction of Glycol Mercaptoesters with Model Quinones", *J. Wood Chem. Technol.,* **2000**, *20(1)*, 1.

T. J. Elder, B. J. W. Cole, and R. C. Fort, Jr., "Combined Experimental and Computational Studies of Lignin", in *Advances in Ligninocellulosics Characterization*, D. S. Argyropoulos, ed., Tappi Press, **1999**; Chapter 15.

B. J. W. Cole, C. Zhou, and R. C. Fort, Jr., “The Bleaching and Photostabilization of High-Yield Pulp. I. Reaction of Thioglycerol with Model Quinones”, *J. Wood. Chem. Tech.,* **1996**, *16(4),* 381.

J. Foley, R. C. Fort Jr., K. McDougal, M. R. M. Bruce, and A. E. Bruce, “Electronic and Steric Effects in Gold (I) Phosphine Thiolate Complexes”, *Metal-Based Drugs*, **1994**, *1*, 419.

J. Ralph, R. F. Helm, R. C. Fort Jr., and T. J. Elder, "Stereoselectivity in Benzyl Aryl Ether Cleavage by Bromotrimethylsilane", *J. Chem. Soc, Perkin I*, **1994**, 2117.

"Ab Initio Calculations on Pentadienyl. Estimation of the Rotational Barrier and Delocalization Energy", *J. Org. Chem*., **1993,** *57*, 211; with D. A. Hrovat and W. T. Borden.

"Ab Initio Calculations on m-Quinone. The Ground State is a Triplet", *J. Am. Chem. Soc.*, **1992**, *113*, 7549; with D. A. Hrovat, S. J. Getty, P. W. Lahti, and W. T. Borden

"Minimum Energy Conformations of Pinoresinol, Its Epimers, and Related Quinone Methides", Holzforschung, **1992,** *46*, 241; with A. L. Smith.

Thirty publications prior to 1992.

Educational Publications

B. L. Jensen and R. C. Fort Jr., "Molecular Mechanics and Variable Temperature Proton NMR Studies on N,N-Diethyl-*m*-Toluamide", J. Chem. Ed., **2001**, *78*, 538.

Published Reviews

Book Review. "Reviews in Computational Chemistry, Vol. 8", *J. Am. Chem. Soc.,* **1997,** *119*, 1499.

Software Review. "ChemWindow and Entropy Lite", *J. Chem. Inf. Comp. Sci.,* **1995,** *35*, 932.

Books

"Adamantane: The Chemistry of Diamond Molecules", Marcel Dekker, New York, 1976

"Modern Experimental Organic Chemistry", The Macmillan Company, New York, 1971; with D. L. Fishel

Recent Presentations

Nazia Sidduqui, Ryan Lena, Douglas Bousfield, Ryan Mills, Douglas J. Gardner, Raymond C. Fort Jr., and Barbara J. W. Cole. "Characterization of Mechanically and Enzymatically Produced Nanofibrillated Cellulose (NFC) from Wood Pulp", Oral presentation at the ACS National Meeting, New Orleans, March 2008.

D. Montgomery, M. Nguyen, B. J. W. Cole, and R. C. Fort Jr, "Docking of Lignin Models and Lignin-Carbohydrate Compounds to the Laccase from *T. Versicolor*", Poster presented at the Gordon Research Conference on Physical Organic Chemistry, Holderness School, Plymouth, NH, June 2007.

D. Montgomery, M. Nguyen, B. J. W. Cole, and R. C. Fort Jr, "Docking of Lignin Models and Lignin-Carbohydrate Compounds to the Laccase from *T. Versicolor*", Poster presented at the 10th International Congress on Biotechnology in the Pulp and Paper Industry, Madison, WI, June 2007

L. B. Graham, J. M. Genco, B. J. W. Cole, and R. C. Fort Jr, "Comparison of Acid and Enzymatic Hydrolysis of Birch Xylan", Poster presented at the 10th International Congress on Biotechnology in the Pulp and Paper Industry, Madison, WI, June 2007.

R. C. Fort Jr., M. Ortner, and J. M. Quimby, "Molecular Dynamics Study of the Folding of the Alzheimer's β-Amyloid Protein", POSTER presented at the Gordon Research Conference on Physical Organic Chemistry, Holderness School, Plymouth, NH, July 2005.

T. Elder and R. C. Fort Jr., "Computational Electrochemistry of Lignin Model Compounds", POSTER presented at the 13th International Symposium on Wood, Fiber, and Pulping Chemistry, Auckland, NZ, May, 2005; Abstracts, p. 113.

R. C. Fort Jr., B. J. W. Cole, M. Nguyen, R. M. Pedro, and K. R. Overly, "Selectivity in the Oxidation of Carbohydrate-bound Lignin. I. Docking of Lignin Models to the Laccase from *Trametes versicolor*", POSTER presented at the 13th International Symposium on Wood, Fiber, and Pulping Chemistry, Auckland, NZ, May, 2005; Abstracts, p. 87.

R. C. Fort Jr., M. Ortner, and J. Quimby, "Molecular Dynamics Study of the Folding of the Alzheimer's β-Amyloid Protein", invited talk at Bates College, Lewiston, ME; 23 March 2005

K. R. Overly, R. C. Fort Jr., and R. J. Pedro, "Automated docking of Lignin Model Compounds in the Active Site of Laccases from *Trametes Versicolor*", 229th National Meeting, American Chemical Society, San Diego, March 2005 (poster)

D. F. Guay, B. J. W. Cole, M. C. Hausman, R. C. Fort Jr. and Oh-kyu Lee, "Reactions of Photochemically Generated Hydroxyl Radicals with Cellulose Models and Cellulose," oral presentation, 12th International Symposium on Wood and Pulping Chemistry, Madison, WI, June 8 – 12, 2003

Margaret C. Hausman, Thomas R. Elder, and Raymond C. Fort Jr., "How Do Phenoxyl Radicals Form During Oxygen Delignification?", poster, 12th International Symposium on Wood and Pulping Chemistry, Madison, WI, June 8 – 12, 2003

H. Zou, J. M. Genco, A. van Heiningen, B. J. W. Cole, R. C. Fort Jr., "Effect of Hemicellulose Content in Kraft Brown-stock on Oxygen Delignification", TAPPI Fall Technical Conference and Trade Fair, San Diego, September 2002.

R. C. Fort, Jr., D. F. Guay, M. C. Hausman, B. J. W. Cole, and K. R. Overly, "SH2 Reactions of Hydroxyl Radicals with Carbohydrates and Cellulose", Poster, Gordon Research Conference on Physical Organic Chemistry, Holderness School, Plymouth, NH, July 1 - 6, 2001

D. F. Guay, B. J. W. Cole, R. C. Fort, Jr., M. C. Hausman, J. M. Genco, and K. R. Overly, "Reactions of Photochemically Generated Hydroxyl Radicals with

Cellulose Models and Cellulose". Poster, 11th International Symposium on Wood and Pulping Chemistry, Nice, France, June 11 - 14, 2001

Cole, B. J. W.; Spender, J.M.; Fort, R. C. Jr., "Reactions of Thiols and Quinones in Pulp", Presented at the Sixth European Conference on Lignocellulosics and Pulp, Bordeaux, France, September, 2000.

"Estimation of Pulp Yield from COD Measurements in Oxygen Delignification", K. D. Zorn, G. M. Bubniak, J. M. Genco, B. J. W. Cole, A. van Heiningen, and R. C. Fort, Jr., TAPPI Pulping Conference, Atlanta, May 2000.

"Reaction of Lignin and Cellulose Model Compounds with Hydroxyl Radical", R. C. Fort, Jr., B. J. W. Cole, M. Hausman, and D. F. Guay, Invited paper, Symposium on Oxygen Delignification, 219th National ACS Meeting, San Franciso, CA, March 2000.

"Reaction of Lignin and Cellulose Models with Hydroxyl Radical and Superoxide in Aqueous Solution", R. C. Fort Jr., B. J. W. Cole, M. Hausman, D. F. Guay, and J. M. Genco, Poster presented at the Gordon Research Conference on Physical Organic Chemistry, Holderness School, Plymouth, NH, June 1999.

"Mechanisms of Oxidative Degradation of Carbohydrates During Oxygen Delignification", D. F. Guay, B. J. W. Cole, R. C. Fort, Jr., J. M. Genco, and M. C. Hausman, 10th International Symposium on Wood and Pulping Chemistry, Yokohama, Japan; Vol. 1, 222, June 1999.

Recent Grant History

Proposals Funded

2005	“New England Wood Utilization Research”, USDA-CSREES, $716,952, with B. J. W. Cole, S. Shaler, J. M. Genco, *et al*.
2005	New England Green Chemistry Consortium, US-DEP, $60,000, with B. J. W. Cole, J. M. Genco, and A. van Heiningen
2004	“New England Wood Utilization Research”, USDA-CSREES, $736,009; with S. Shaler, B. J. W. Cole, J. M. Genco, *et al*.
2003	“New England Wood Utilization Research”, USDA-CSREES, $807,486; with S. Shaler, B. J. W. Cole, J. M. Genco, et al.
2002	“Optimizing Oxygen Delignification”, USDA-CSREES, $136,435; with B. J. W. Cole and J. M. Genco
2001	"Mechanisms and Limitations of Oxygen Delignification", USDA-CSREES, $126, 840; with B. J. W. Cole and J. M. Genco

1999 "Chlorine-free, Sulfur-free Pulping", USDA-CSREES; $81,100; with B. J. W. Cole, J. M. Genco, and A. van Heiningen

1998 "Stabilization of High-Yield Pulp, USDA-CGI, $146,000; 2 years; with B. J. W. Cole

Approximately $650,000 in grants prior to 1998

Other Recent Proposals

2005 "New England Wood Utilization Research", USDA-CSREES, $716,952; with S. Shaler, B. J. W. Cole, J. M. Genco, et al., PENDING

2004 "Understanding Fungal Oxidases for Applications in Biopulping and Fiber Modification", USDA, $498,775; not funded; with B. J. W. Cole and C. Houtman

2001 "Conformational Mutations and Metal Complexation Reactions", NIH, $691, 055, *not funded*; with T. Solouki and H. H. Patterson

2000 "Molecular Mechanisms of Oxygen Delignification", NSF; $2,875, 512; *not funded*; with B. J. W. Cole, J. M. Genco, and A. van Heiningen

2000 "Selected Extended Oxygen Delignification by Fundamental Chemical and Kinetic Studies", DoE, $813,981; *not funded*; with B. J. W. Cole, J. M. Genco, and A. van Heiningen.

1999 "Mechanistic Study of Hydroxyl Radical Cleavage of Carbohydrate Models", PRF, $59,710; not funded

Professional Service

Akron Section, American Chemical Society

Program Committee, 1977-1978, 1984-1985

Awards Committee, 1979-1984
Chairman, 1980-1982

Program Chairman, Central Regional Meeting, American Chemical Society, 1978

Co-Chairman, Symposium on Adamantanes in Organic and Medicinal Chemistry, Northeast Regional Meeting, American Chemical Society, Clarkson College; 1980

General Chairman, Northeast Regional Meeting, American Chemical Society, University of Maine, 1988

Steering Committee Member and Local Chairman, 24th Reaction Mechanisms Conference, held at the University of Maine, June 1992

Recent Refereeing (last three years)

Refereed papers for: *Journal of the American Chemical Society*
Journal of Organic Chemistry
Journal of Physical Organic Chemistry

Refereed software for: *Journal of Chemical Information and Computer Science*

Refereed proposals for: National Science Foundation
National Research Council
North Carolina Biotechnology Commission
U. S. Department of Agriculture

Public Service

Volunteer Science Fair judge, Eastern Maine public schools, 1986-1987

Extensive volunteer consulting in Maine high schools, 1986 - present; safe storage and disposal of chemicals.

United Way coordinator, College of Sciences, University of Maine, 1989 -1991

Extensive consulting on chemistry-related issues for several Bangor attorneys

University Service

Search Committee for Environmental Safety Officer, University of Maine, 1994, 2000

Environmental Health and Safety Committee, University of Maine, 1996-

Chemical Safety Committee, University of Maine, 1994 -

Faculty Senate, 1998 - 2000

Faculty Representative, Maine OSHA/Umaine Working Group, 1998 - present

College of Liberal Arts and Sciences

Technology Committee, 1997 - 2001
(Chair, 1997-1998)

Department of Chemistry:

1. The Curriculum Committee (Chairman), 1993 -

2. Safety Committee (Chairman), 1998 -

3. Graduate Executive Committee, 1996 -

4. Search Committee for Analytical Chemistry Faculty (Chairman), 1997

5. Search Committee for Organic Chemistry Faculty, 1999

5. System Administrator for the Molecular Modeling Center, 1996 -

6. WebMeister, Department Home Page, 1996 - (http://chemistry.umeche.maine.edu/ChemHome.html)