

Name: Raymond John Butcher

Date of Birth: 11th October 1945

Title: Professor

Education:

B.Sc. (Hons) 1968 University of Canterbury, Christchurch, New Zealand.

Ph.D. 1974 Inorganic Chemistry and X-ray Crystallography, University of Canterbury, Christchurch, New Zealand.

Positions Held:

Instructor 1974-76, Chemistry Department, University of Virginia, Charlottesville, Virginia.

Post-Doctoral Fellow 1976-77, Chemistry Department, Georgetown University, Washington D.C.

Assistant Professor 1977-82, Chemistry Department, Howard University, Washington D.C.

Associate Professor 1982-97, Chemistry Department, Howard University, Washington D.C.

Professor 1997-present, Chemistry Department, Howard University, Washington D.C.

Visiting Associate Professor, 1985-86, Chemistry Department, University of Virginia, Charlottesville, VA.

Adjunct Associate Professor, summers of 1987, 1988 and 1989, Chemistry Department, Hampton University, Hampton, VA.

NASA Summer Faculty Fellow at Goddard Space Flight Center, summer 1987.

NASA Summer Faculty Fellow at Goddard Space Flight Center, summer 1988.

Navy Senior Scientist Summer Faculty Fellow at the Naval Research Laboratory, summer, 1989-2000

Fulbright International Scholar to India, fall 1989

Visiting Associate Professor, Department of Chemistry, University of Canterbury, Christchurch, New Zealand, August to December 1993.

Visiting Senior Scientist, Division of Inorganic and Structural Chemistry, Los Alamos National Laboratory, Los Alamos, N.M., February to June, 1994.

Navy Distinguished Summer Faculty Fellow at the Naval Research Laboratory, summers of 2001-4, 2006-2008, 2019-21.

Co-Editor, Acta Crystallographica E: Data Reports.

Co-Editor, IUCr Data Reports.

Editor of the Special Issue of Structural Chemistry devoted to Structural Science in India (2007).

Fulbright-Nehru Fellow at the Indian Institute of Technology, Bombay, India from August 23rd 2009 to January 15th 2010.

Visiting Professor at the Indian Institute of Technology Bombay, in Mumbai, India, from December 8th 2012 to January 6th, 2013.

AP Chemistry Reader 2008, 2014-2022

GIAN Professor, Jiwaji University, 13 June – 26 June, 2016.

Visiting Distinguished Professor at the Indian Institute of Technology Bombay, in Mumbai, India, from July 4th to July 14th, 2016.

AP Chemistry Reader, 2008-2010 and 2013-2022.

Fellow of the Royal Society of Chemistry (FRSC)

Distinguished Chair Fulbright-Nehru Fellow to India, January to May 2019.

Honors Received:

Sigma Xi Visitors Medal for Outstanding Research at the University of Virginia in 1977

Publications:

1. Infrared Spectra and Configurations of some Molybdenum(VI) Dihalide Dioxide Complexes, by Ray J. Butcher, H. P. Guntz, R. G. A. R. MacLagan, H. K. J. Powell, C. J. Wilkins, and Y. S. Hian, J. C. S. Dalton, 1223 (1975).
2. Novel Nickel(II) Dimers, by Ray J. Butcher and E. Sinn, J.C.S. Chem. Comm., 832 (1975).
3. Structural Studies of Molybdenum(VI) Coordination Chemistry: The Crystal and Molecular Structure of Ammonium(*cis*dioxouramil-N,N-diacetato)molybdenum (VI) Monohydrate, by Ray J. Butcher and B. R. Penfold, J. Cryst. Mol. Struct., 6, 1 (1976).
4. Structural Studies of Molybdenum Coordination Chemistry: The Crystal and Molecular Structure of Tripotassium*cis*trioxonitritotriacetato)-molybdenum(VI) Monohydrate, by Ray J. Butcher and B. R. Penfold, J. Cryst. Mol. Struct., 6, 13 (1976).
5. Structural Effect of Adding Paired and Unpaired Electrons to Otherwise Identical Transition Metal Systems: Relation between Magnetic and Structural Properties in Iron(III) Complexes: Observation of a New Intermediate Iron(III) Spin State ($S = 3/2$), and the Structures of Benzene Solvated Tris(4-morpholine-carbodithioato-S,S')chromium(III), Iron(III), Cobalt(III), Rhodium(III) and Iridium(III), by Ray J. Butcher and E. Sinn, J. Amer. Chem. Soc., 98, 2440 (1976).
6. New Amino-acid Complexes of Molybdenum, by Ray J. Butcher, H. K. J. Powell, C. J. Wilkins and Yong S. H., J.C.S. Dalton, 356 (1976).
7. Bis(ethanolatonitrato(N-ethyl-5-chloro-2-hydroxybenzylidene)aminato-di- μ -O-nickel(II)): Synthesis and Structure of a New Type of Nickel(II) Dimer, by Ray J. Butcher, J. Jasinski, G. M. Mockler and E. Sinn, J.C.S. Dalton, 1099 (1976).
8. Crystal and Molecular Structures of Dichloromethane Solvated Tris(4-morpholinecarbodithioato-S,S') Complexes of Chromium(III), Manganese (III) and Rhodium(III): Comparison of Coordination Spheres, by Ray J. Butcher and E. Sinn, J.C.S. Dalton, 2517 (1976).

9. Relation between Magnetism and Structure of Iron(III) Complexes Exhibiting an $S = 3/2 \leftrightarrow S = 5/2$ Spin State Equilibrium: Structures of Chloroform and Water Solvated Tris-(4-morpholinecarbodithioato-S,S')- iron(III) and Manganese(III), by Ray J. Butcher and E. Sinn, J. Amer. Chem. Soc., 98, 5159 (1976).
10. The Crystal and Molecular Structure of Aquodibromo(biquinolyl)manganese (II), by Ray J. Butcher and E. Sinn, J.C.S. Dalton, 1186 (1976).
11. On the Nature of the High Spin - Low Spin Crossover in Tris-(N-ethyl-N-phenyldithio-carbamato)iron (III), by Ray J. Butcher, J. R. Ferraro and E. Sinn, Inorg. Chem., 15, 2077 (1976).
12. Relation between Magnetic, Spectroscopic, and Structural Properties of Bis-[chloro(N-i-propyl-2-hydroxybenzylidene)aminato- μ -O-copper(II)] and Bis(N-i-propyl-2-hydroxy-benzylideneaminato)copper (II), by Ray J. Butcher and E. Sinn, Inorg. Chem., 15, 1604 (1976).
13. Nature and Mechanism of the High Spin - Low Spin Crossover and the Existence of Intermediate Spin States, by Ray J. Butcher, J. R. Ferraro and E. Sinn, J.C.S.Chem.Comm., 910 (1976).
14. Synthesis and Relation between Magnetic and Structural Properties of a Series of Monomeric and Dimeric Nickel(II) Complexes: Crystal and Molecular Structures of Bis(2,2'-biquinolyl)di-chlorodi- μ -chlorodinickel(II), 2,2'-biquinolyl dibromonickel(II), Bis(2,9-dimethyl-1,10-phenanthroline)dichlorodi- μ -chlorodinickel(II), Bis(2,9-dimethyl-1,10-phenanthroline)di-bromodi- μ -bromodinickel(II) and 2,9-Dimethyl-4,7-diphenyl-1,10-phenanthroline diiodo-nickel(II), by Ray J. Butcher and E. Sinn, Inorg. Chem., 16, 2334 (1977).
15. Protonation-Induced Dynamic Stereochemistry of Hexatungstobisorganoarsonate Anions, by S. H. Wasfi, W. Kwak, M. T. Pope, K. M. Barkigia, Ray J. Butcher and C. O. Quicksall, J. Amer. Chem. Soc., 100, 7786 (1978).
16. The Crystal Structures of cis-Dioxodibromobis(triphenylphosphineoxide)-molybdenum(VI), cis-Dioxodichlorobis(triphenylphosphineoxide)molybdenum(VI) and cis-Dioxobis(butane-2,3-diolato)-molybdenum(VI) Bis(butane-2,3-diol): A Comparison of Coordination Spheres and the General Stereochemistry of Molybdenum(VI) Oxo Complexes, by Ray J. Butcher, B. R. Penfold and E. Sinn, J.C.S. Dalton, 668 (1979).
17. Relationships between Structure and Magnetism in Binuclear Complexes of Nickel(II) with the Sterically Hindered Ligands Biquinoline, 2,9-Dimethyl-1,10-phenanthroline, and 4,7-Diphenyl-2,9-dimethyl-1,10-phenanthroline, by Ray J. Butcher, C. J. O'Connor and E. Sinn, Inorg. Chem., 18, 492 (1979).

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19. Synthesis and Relation between Magnetism and Structure of the Binuclear Copper(II) Oxime Complex; $[\text{CuL}(\text{ClO}_4)]_2$, $[\text{CuL}(\text{CH}_3\text{OH})]_2 (\text{ClO}_4)_2$, where HL = 1-(N,N-Dimethyl)-2-aminoethy-amino-1-phenyl-2-oximo-propane, by Ray J. Butcher and E. Sinn, *Inorg. Chem.*, 18, 1913 (1979).

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21. Proof of a Linear Fe-NO Linkage, Perpendicular to the S_4 Plane in $\text{Fe}(\text{NO})[\text{S}_2\text{CN}\{\text{CH}(\text{CH}_3)_2\}_2]_2$: A New (Aerobic) Synthesis of the Complex and its Crystal Structure, by Ray J. Butcher and E. Sinn, *Inorg. Chem.*, 19, 3622 (1980).

22. Synthesis and Relation between Magnetism and Structure of a Trinuclear Copper(II) Hydroxo Complex $[\text{Cu}_3(\text{OH})\text{L}_3(\text{ClO}_4)] (\text{ClO}_4)$ and a Hexanuclear Copper(II) Oxo Complex $[\text{Cu}_3\text{OL}'_3 (\text{ClO}_4)]_2$, (LH = 3-(phenylimino)butanone-2-oxime, L'H = 1,2-Diphenyl-2-(methylimino)-ethanone-1-oxime), by Ray J. Butcher, C. J. O'Connor, and E. Sinn, *Inorg. Chem.*, 20, 537 (1981).

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25. Synthesis and the Relation between Structure and Magnetism of the Dimeric Anionic Nickel(II) Complex $[\text{C}_5\text{H}_{10}\text{NH}_2]^+[\text{Ni}_2(\text{PhSal})_4 (\text{CH}_3\text{COO})]^-$, by Ray J. Butcher, C. J. O'Connor and E. Sinn, *Inorg. Chem.*, 21, 616 (1982).

26. Crystal Structure of $[\text{Bis-1-N}'\text{-(N-2-aminoethylmorpholine)-1-phenylpropane-2-oximobis-perchloratodicopper(II)}].[\text{Bis-1-N}'\text{-(N-2-aminoethylmorpholine)-1-phenylpropane-2-oximobismethanol-dicopper(II)}]\cdot\text{Perchlorate}$, by K. A. Akinade, Ray J. Butcher and E. Sinn, *Cryst. Struct. Comm.*, 11, 2063 (1982).

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28. The Nitration of Metal-Ion Coordinated Imidazole and the Crystal Structure of Pentaamminecobalt (III)(4-nitroimidazolato)chloride, by C. B. Storm, C. M. Freeman, Ray J. Butcher, A. H. Turner, N. S. Rowan, F. O. Johnson and E. Sinn, *Inorg. Chem.*, 22, 678 (1983).

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31. The Crystal and Molecular Structure of Tetratolylporphine: Implications for the ^{15}N CP-MAS NMR Spectrum, by Ray J. Butcher, G. B. Jameson and C. B. Storm, *J. Amer. Chem. Soc.*, 107, 2978 (1985).

32. Copper Complexes of Binucleating N,N'-hydroxyalkyldiaminebis(salicylidine) Ligands Containing a Cu-O-Cu Bridge and an Exogenous Bridge, by Ray J. Butcher, G. Diven, G. Erickson, G. M. Mockler and E. Sinn, *Inorg. Chim. Acta*, 111, L55, (1986).

33. Towards a Hemocyanin Model. Effect of Interplanar Angles on Exchange Coupling in Binuclear Copper Complexes, by Ray J. Butcher, G. Diven, G. Erickson, G. M. Mockler and E. Sinn, *Inorg. Chim. Acta*, 123, L17 (1986).

34. Crystal and Molecular Structure of N-(2-morpholinoethyl)-2-oximato-1-phenylpropan-1-imine-chloropalladium(II), by K. A. Akinade, A. Adeyemo, Ray J. Butcher and E. Sinn, *J. Crystallogr. Spectrosc. Res.*, 16, 597 (1986).

35. Structure of Leuconolam, an Alkaloid containing an Unusual Nine-Membered Ring, by Ray J. Butcher, Chen Wei, A. R. M. Ali, S. H. Goh, and E. Sinn, *Acta Cryst*, C42, 349 (1986).

36. Organotransition-Metal Metallocarboranes. 10. π -Complexation of nido-(PhCH_2) $_2\text{C}_2\text{B}_4\text{H}_6$ at the C_2B_3 and C_6 Rings. Synthesis and Crystal Structures of nido-2,3-[(CO) $_3\text{Cr}(\text{C}_6\text{H}_5)\text{CH}_2$ -2,3- $\text{C}_2\text{B}_4\text{H}_6$ and (PhCH_2) $_4$ - $\text{C}_4\text{B}_8\text{H}_8$. A Nonfluxional C_4B_8 Cluster, by J. T. Spencer, M. R. Pourian, Ray J. Butcher, E. Sinn and R. N. Grimes, *Organometallics*, 6, 335 (1987).

37. The Structure of (I) Dimethyl-N,N'-[1,1'-p-phenylenebis(1-methylethyl)]dicarbamate, $C_{16}H_{26}N_2O_4$, and (II) Diethyl-N,N'-[1,1'-p-phenylenebis(1-methylethyl)]dicarbamate, $C_{18}H_{28}N_2O_4$: Model Compounds for Diol Linked TMXDI Units in Polyurethane Hard Segments, by J. P. Jasinski, C. R. Desper, B. A. Zentner, Ray J. Butcher and C. F. Day, *Polym. Repr.*, 28, 472 (1987).
38. The Structures of (I) Dimethyl-N,N'-[1,1'-p-phenylenebis(1-methylethyl)]dicarbamate, $C_{16}H_{26}N_2O_4$, and (II) Diethyl-N,N'-[1,1'-p-phenylenebis(1-methylethyl)]dicarbamate, $C_{18}H_{28}N_2O_4$, by J. P. Jasinski, C. R. Desper, B. A. Zentner, Ray J. Butcher and C. F. Day, *Acta Cryst*, C44, 1135 (1988)
39. The Structure of Dimethyl-N,N'-trans-1,4-cyclohexanedicarbamate (I) and Diethyl-N,N'-[1,1'-p-phenylbis(1-methylethyl)]dicarbamate (II), by J. P. Jasinski, C. R. Desper, B. A. Zentner, and Ray J. Butcher, *Acta Cryst*, C44, 1137 (1988).
40. Synthesis and Crystal Structure of Bis(triphenylarsineoxide)(p-chlorophenyl)-diphenyltin(IV) Tetraphenylborate, $\{(p-ClC_6H_4)(C_6H_5)_2Sn-[(C_6H_5)_3AsO]_2[B(C_6H_5)_4]\}$, by W. K. Ng, W. Chen, V. G. Kumar Das, and Ray J. Butcher, *J. Organometallic Chem.*, 361, 53 (1989).
41. Structure of (p-chlorophenyl)bis(quinolin-8-olato)(p-tolyl)tin(IV), $[Sn(p-Cl-C_6H_4)(p-CH_3C_6H_5)(C_9H_6NO)_2]$, by W. Chen, S. K. Ng, V. G. Kumar Das, G. B. Jameson, and Ray J. Butcher, *Acta Cryst(C)*, C45, 861 (1989).
42. Structural Aspects of the Bis(2,2'-dipicolylamine)iron(II) Cation, by Ray J. Butcher, A. W. Addison, and C. G. Wahlgren, *Inorg. Chim. Acta*, 158, 211 (1989).
43. Structural Studies of Diorganotin(IV) Bischelates. Crystallographic Evidence of Seven-Coordinate Tin in Bis(2-carbomethoxyethyl)bis(N,N-dimethyldithiocarbamate)-tin(IV), $[MeOC(O)(CH_2)_2]_2Sn[SC(S)NMe_2]_2$, by W. Chen, W. K. Ng, V. G. Kumar Das, G. B. Jameson, and Ray J. Butcher, *J. Organometallic Chem.*, 365, 75 (1989).
44. Variable Temperature Tin-119m Moessbauer Spectroscopic and X-ray Crystallographic Study of Triphenyltin(IV) Chloroacetate, $[(C_6H_5)_3SnOC(O)CH_2Cl]$, and a Redetermination of Triphenyltin(IV) Acetate, by Seik Weng Ng, Kwai Lan Chin, Chen Wei, V. G. Kumar Das, and Ray J. Butcher, *J. Organometallic Chem.*, 376, 277 (1989).
45. Ferromagnetic and Antiferromagnetic Complexes of Cobalt(II) and Nickel(II), by Ray J. Butcher, proceedings of the Warren E. Henry Symposium on Magnetism, Lecture Notes in Physics #337, Springer-Verlag Press, 1989.

46. Model Compounds for the Type III Site and the Combined Type II and Type III Sites in Multicopper Oxidases, by Ray J. Butcher, E. Sinn, and G. M. Mockler, *Proc. Indian Acad. Sci. (Chem. Sci.)*, 102, 209 (1990).
47. Structure of a Dinuclear Tin Adduct: μ -[ethylenebis(diphenylphosphineoxide)]-bis[bromobis-(p-chlorophenyl)(p-tolyl)tin(IV)], by C. Wei, N. W. Kong, V. G. K. Das, G. B. Jameson, and Ray J. Butcher, *Acta Cryst(C)*, C46, 2034 (1990).
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50. Synthesis and Characterization of Novel Chiral *Ortho*-Tellurated Complexes Derived from 1-(S)-(Dimethylamino)ethylbenzene: Crystal and Molecular Structure of {2-[(S)-1-(Dimethyl-amino)ethyl]-phenyl}tellurium Trichloride, by H. B. Singh, N. Sudha, and Ray J. Butcher, *Inorg. Chem*, 31, 1431 (1992).
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52. Synthesis, Structure, and Spectroscopic Properties of Vanadium(III) and (IV) Complexes Containing Hydridotris(pyrazolyl)borate Ligands. 3, by M. Mohan, S. M. Holmes, Ray J. Butcher, J. P. Jasinski, and C. J. Carrano, *Inorg. Chem.*, 31, 2029 (1992).
53. Reactions of $\text{LiE}(\text{SiMe}_3)_2$ with Compounds Containing Four-Membered Core Rings Having the General Formula MEMCl ($\text{M} = \text{In}$, $\text{E} = \text{As}$, P ; $\text{M} = \text{Ga}$, $\text{E} = \text{As}$): Novel Rearrangement Reactions to Form Adducts of the Type $\text{R}_3\text{M}\ddot{\text{O}}\text{As}(\text{SiMe}_3)_3$ ($\text{R} = \text{CH}_2\text{SiMe}_3$, $\text{M} = \text{In}$; $\text{R} = \text{Ph}$, $\text{M} = \text{Ga}$) by Richard L. Wells, Andrew T. McPhail, Leonidas J. Jones III, Mark F. Self, Ray J. Butcher and Cliff George, *Organometallics*, 11, 2694 (1992).
54. Liquid-Crystalline Solvents as Mechanistic Probes. 45. The Norrish II Reactions of Liquid-Crystalline Ketones. Comparison between Smectic B and Solid Phase Order and Control of Photoproduct Distributions, by I. Furman, Ray J. Butcher, R. M. Catchings, and R. G. Weiss, *J. Amer. Chem. Soc.*, 114, 6023 (1992).

55. Structure of Bis(ethylenediamine)(aniline)(chloro)cobalt(III) chloride, $C_{10}H_{15}N_5Cl_3Co$, by Ray J. Butcher, M. M. D. Deyrup, and C. B. Storm, *Acta Cryst(C)*, C48, 1122 (1992).
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