

## PUBLICATIONS OF KENNETH N. RAYMOND

1. Kenneth N. Raymond and Fred Basolo, "The Isolation of Pentacyanonickelate(II) Salts," *Inorg. Chem.* **1966**, *5*, 949-950.
2. Kenneth N. Raymond and Fred Basolo, "The Synthesis of a Molecular Metal Complex Containing Both M-N and M-S Bonded Thiocyanate Ions," *Inorg. Chem.* **1966**, *5*, 1632-1633.
3. Kenneth N. Raymond, P. W. R. Corfield and James A. Ibers, "New Conformers of Tris(ethylenediamine)chromium(III)," *Inorg. Chem.* **1968**, *7*, 842-844.
4. Kenneth N. Raymond, Devon W. Meek and James A. Ibers, "The Structure of Hexaamminechromium(III) Pentachlorocuprate(II), [Cr(NH<sub>3</sub>)<sub>6</sub>][CuCl<sub>5</sub>]," *Inorg. Chem.* **1968**, *7*, 1111-1117.
5. Kenneth N. Raymond, P. W. R. Corfield and James A. Ibers, "The Structure of Tris(ethylenediamine)chromium(III) Pentacyanonickelate(II) Sesquihydrate, [Cr(NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>)<sub>3</sub>][Ni(CN)<sub>5</sub>]•1.5H<sub>2</sub>O," *Inorg. Chem.* **1968**, *7*, 1362-1372.
6. William E. Hatfield, Robin Whyman, Robert C. Fay, Kenneth N. Raymond and Fred Basolo, "Lattice-stabilized Complex Ions," *Inorg. Syn.* **1968**, *11*, 48-52.
7. Kenneth N. Raymond and James A. Ibers, "The Structure of Tris(ethylenediamine)-chromium(III) Hexacyanocobaltate(III) Hexahydrate, [Cr(C<sub>2</sub>H<sub>8</sub>N<sub>2</sub>)<sub>3</sub>][Co(CN)<sub>6</sub>]•6H<sub>2</sub>O," *Inorg. Chem.* **1968**, *7*, 2333-2338.
8. Allan Zalkin and Kenneth N. Raymond, "The Structure of Di- $\pi$ -cyclooctatetraeneuranium (Uranocene)," *J. Am. Chem. Soc.* **1969**, *91*, 5667-5668.
9. R. Lyle Patton and Kenneth N. Raymond, "The Crystal and Molecular Structure of S<sub>2</sub>N<sub>2</sub>(SbCl<sub>5</sub>)<sub>2</sub>," *Inorg. Chem.* **1969**, *8*, 2426-2431.
10. Kenneth N. Raymond, "An Example of a New Type of Five-coordinate Transition Metal Complex: [Cr(NH<sub>3</sub>)<sub>6</sub>][CuBr<sub>3</sub>Cl<sub>2</sub>]," *Chem. Commun.* **1969**, 1294-1295.
11. Aristides Terzis, Kenneth N. Raymond and Thomas G. Spiro, "On the Structure of Ni(CN)<sub>5</sub><sup>3-</sup>. Raman, Infrared, and X-ray Crystallographic Evidence," *Inorg. Chem.* **1970**, *9*, 2415-2420.
12. K. N. Raymond and H. R. Wenk, "Lunar Ilmenite (Refinement of the Crystal Structure)," *Contr. Mineral. and Petrol.* **1971**, *30*, 135-140.
13. Eileen N. Duesler and Kenneth N. Raymond, "Conformational Effects of Intermolecular Interactions. The Structure of Tris(ethylenediamine)-cobalt(III) Monohydrogen Phosphate Nonahydrate," *Inorg. Chem.* **1971**, *10*, 1486-1492.

14. John L. Shafer and Kenneth N. Raymond, "Distorted Five-Coordinate Cobalt(II). The Structure of Bromotris(3-aminopropyl)aminocobalt(II) Bromide Hemiethanolate," *Inorg. Chem.* **1971**, *10*, 1799-1803.
15. Steven A. Goldfield and Kenneth N. Raymond, "Axial Bond Length Contraction in CuX<sub>5</sub> Complexes. The Structures of Hexaammine-chromium(III) Pentabromocuprate(II) and Hexaamminechromium(III) Tribromodichlorocuprate(II)," *Inorg. Chem.* **1971**, *10*, 2604-2607.
16. Stephen Z. Goldberg, Eileen N. Duesler and Kenneth N. Raymond, "Crystal and Molecular Structure of [Mn(CO)<sub>4</sub>(C<sub>2</sub>PPh<sub>3</sub>)Br]—a Coordination Compound of the Unusual Carbonyl-ylide Product, Ph<sub>3</sub>P<sup>+</sup>-C≡C:<sup>-</sup>," *Chem. Commun.* **1971**, 826-827.
17. Keith O. Hodgson, D. Dempf and Kenneth N. Raymond, "Eclipsed and Staggered Configurations for a Methyl-substituted Cyclo-octatetraenyl Dianion Complex of Uranium(IV): X-ray Determination of the Structure of U[C<sub>8</sub>H<sub>4</sub>(CH<sub>3</sub>)<sub>4</sub>]<sub>2</sub><sup>-</sup>," *Chem. Commun.* **1971**, 1592-1593.
18. Keith O. Hodgson and Kenneth N. Raymond, "A Dimeric π-Cyclooctatetraene Dianion Complex of Cerium(III). The Crystal and Molecular Structure of [Ce(C<sub>8</sub>H<sub>8</sub>)Cl•2OC<sub>4</sub>H<sub>8</sub>]<sub>2</sub><sup>-</sup>," *Inorg. Chem.* **1972**, *11*, 171-175.
19. Kenneth N. Raymond, "Application of Constraints to Derivatives in Least-Squares Refinement," *Acta Crystallogr.* **1972**, *A28*, 163-166.
20. Alex Avdeef, Kenneth N. Raymond, Keith O. Hodgson and Allan Zalkin, "Two Isostructural Actinide π Complexes. The Crystal and Molecular Structure of Bis(cyclooctatetraenyl)uranium(IV), U(C<sub>8</sub>H<sub>8</sub>)<sub>2</sub>, and Bis(cycloocta-tetraenyl)thorium(IV), Th(C<sub>8</sub>H<sub>8</sub>)<sub>2</sub>," *Inorg. Chem.* **1972**, *11*, 1083-1088.
21. Stephen Z. Goldberg, Eileen N. Duesler and Kenneth N. Raymond, "The Crystal and Molecular Structure of [Mn(CO)<sub>4</sub>(C<sub>2</sub>P(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>)Br]. A Coordination Compound of the Unusual Carbonyl-Ylide Reaction Product (C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>P<sup>+</sup>-C≡C:<sup>-</sup>," *Inorg. Chem.* **1972**, *11*, 1397-1401.
22. Leo D. Brown, Kenneth N. Raymond and Stephen Z. Goldberg, "Preparation and Structural Characterization of Barium Decacyanodicobaltate(II) Tridecahydrate, Ba<sub>3</sub>[Co<sub>2</sub>(CN)<sub>10</sub>]•13H<sub>2</sub>O, an Air Stable Salt of the [Co<sub>2</sub>(CN)<sub>10</sub>]<sup>6-</sup> Ion," *J. Am. Chem. Soc.* **1972**, *94*, 7664-7674.
23. Keith O. Hodgson and Kenneth N. Raymond, "An Ion Pair Complex Formed between Bis(cyclooctatetraenyl)cerium(III) Anion and an Ether-Coordinated Potassium Cation. The Crystal and Molecular Structure of [K((CH<sub>3</sub>OCH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>O)][Ce(C<sub>8</sub>H<sub>8</sub>)<sub>2</sub>]<sup>-</sup>," *Inorg. Chem.* **1972**, *11*, 3030-3035.
24. Frances A. Jurnak and Kenneth N. Raymond, "Conformations of Six-Membered Rings in Tris Metal Complexes. A Skew-Boat Conformation in [Cr(NH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>2</sub>)<sub>3</sub>]<sup>3+</sup>," *Inorg. Chem.* **1972**, *11*, 3149-3152.

25. Keith O. Hodgson and Kenneth N. Raymond, "Rotomeric Configurations of a Methyl-Substituted Cyclooctatetraene Dianion Complex of Uranium(IV). Crystal and Molecular Structure of Bis(1,3,5,7-tetramethylcyclooctatetraenyl)uranium(IV),  $U(C_8H_4(CH_3)_4)_2$ ," *Inorg. Chem.* **1973**, *12*, 458-466.
26. John Leong, Keith O. Hodgson and Kenneth N. Raymond, "Preparation and Structural Characterization of Tris(benzylcyclopentadienide)-chlorouranium(IV),  $U(C_5H_4CH_2C_6H_5)_3Cl$ ," *Inorg. Chem.* **1973**, *12*, 1329-1335.
27. H. R. Wenk and K. N. Raymond, "Four New Structure Refinements of Olivine," *Z. Kristallogr.* **1973**, *137*, 86-105.
28. William G. Dauben, Andrew J. Kielbania, Jr. and Kenneth N. Raymond, "Transition Metal Catalyzed Rearrangements of Bicyclobutanes. Mechanism of Acid Production in Methanolysis," *J. Am. Chem. Soc.* **1973**, *95*, 7166-7168.
29. Stephen Z. Goldberg and Kenneth N. Raymond, "Trans Interaction in a Metal Carbonyl. Structure of ((Triphenylphosphinemethylide)diphenylphosphine-oxide)pentacarbonyl-tungsten(0),  $W(CO)_5(O=P(C_6H_5)_2CHP(C_6H_5)_3)$ ," *Inorg. Chem.* **1973**, *12*, 2923-2927.
30. Stephen Z. Goldberg, Kenneth N. Raymond, C. A. Harmon and David H. Templeton, "Structure of the  $10\pi$  Electron Cyclooctatetraene Dianion in Potassium Diglyme 1,3,5,7-Tetramethylcyclooctatetraene Dianion,  $[K((CH_3OCH_2CH_2)_2O)]_2[C_8H_4(CH_3)_4]$ ," *J. Am. Chem. Soc.* **1974**, *96*, 1348-1351.
31. John Leong and Kenneth N. Raymond, "Coordination Isomers of Biological Iron Transport Compounds. I. Models for the Siderochromes. The Geometrical and Optical Isomers of Tris(N-methyl- $\ell$ -menthoxyacethydroxamato)chromium(III)," *J. Am. Chem. Soc.* **1974**, *96*, 1757-1762.
32. Steven A. Goldfield and Kenneth N. Raymond, "Axial vs. Equatorial Bonding in Trigonal-Bipyramidal Complexes. Crystal and Molecular Structure of [Bis(triphenylphosphine)-iminium]tetracarbonylcyanoferrate(0),  $[((C_6H_5)_3P)_2N][Fe(CO)_4CN]$ ," *Inorg. Chem.* **1974**, *13*, 770-775.
33. Leo D. Brown and Kenneth N. Raymond, " $\sigma$ -Bonded Dioxygen. X-ray Crystal Structure of  $[NEt_4]_3[Co(CN)_5(O_2)] \cdot 5H_2O$ ," *J. Chem. Soc., Chem. Commun.* **1974**, 470-471.
34. John Leong, J. B. Neilands and Kenneth N. Raymond, "Coordination Isomers of Biological Iron Transport Compounds. III. Transport of  $\Lambda$ -cis-Chromic Desferriferriochrome by *Ustilago sphaerogena*," *Biochem. Biophys. Res. Comm.* **1974**, *60*, 1066-1071.
35. Edgar C. Baker, Gordon W. Halstead and Kenneth N. Raymond, "The Structure and Bonding of 4f and 5f  $\pi$  Sandwich Organometallic Compounds," John M. Haschke and Harry A. Eick, Eds., Proceedings of the 11th Rare Earth Research Conference, Volume I, Sessions A through J, Traverse City, Michigan, October 7-10, **1974**, pp 284-289. [Review](#)

36. Frances A. Jurnak and Kenneth N. Raymond, "Effect of Packing Forces on the Geometry of the  $[\text{Ni}(\text{CN})_5]^{3-}$  Ion: Structures of  $[\text{Cr}(\text{NH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_3][\text{Ni}(\text{CN})_5]\cdot 2\text{H}_2\text{O}$  and  $[\text{Cr}(\text{NH}_3)_6][\text{Ni}(\text{CN})_5]\cdot 2\text{H}_2\text{O}$ . A Skew-Boat Conformation in a Six-Membered Metal Chelate Ring," *Inorg. Chem.* **1974**, *13*, 2387-2397.
37. John Leong and Kenneth N. Raymond, "Coordination Isomers of Biological Iron Transport Compounds. II. The Optical Isomers of Chromic Desferriferriochrome and Desferriferriochrysin," *J. Am. Chem. Soc.* **1974**, *96*, 6628-6630.
38. Leo D. Brown and Kenneth N. Raymond, "X-ray Structure of the Pentacyanocobaltate(II) Anion in Diethyldi-isopropylammonium Pentacyanocobaltate," *J. Chem. Soc., Chem. Commun.* **1974**, 910-911.
39. Edgar C. Baker, Kenneth N. Raymond, Tobin J. Marks, William A. Wachter, "Isolation and Structural Characterization of a  $\mu$ -Di( $\eta^5$ : $\eta^1$ -cyclopentadienyl)dithorium(IV) Complex," *J. Am. Chem. Soc.* **1974**, *96*, 7586-7588.
40. John Leong and Kenneth N. Raymond, "Coordination Isomers of Biological Iron Transport Compounds. IV. Geometrical Isomers of Chromic Desferriferrioxamine B," *J. Am. Chem. Soc.* **1975**, *97*, 293-296.
41. Leo D. Brown, Douglas R. Greig and Kenneth N. Raymond, "Structure of the Chloroform Adduct of Pentakis(phenyl isocyanide)cobalt(I) Perchlorate,  $[\text{Co}(\text{CNC}_6\text{H}_5)_5]\text{ClO}_4\cdot\text{HCCl}_3$ ," *Inorg. Chem.* **1975**, *14*, 645-649.
42. Gordon W. Halstead, Edgar C. Baker and Kenneth N. Raymond, " $\sigma$ - vs.  $\pi$ -Bonded Organoactinides. The Synthesis and Structural Analysis of Tris( $\eta^5$ -cyclopentadienyl)- $\eta^1$ -2-methylallyluranium(IV)," *J. Am. Chem. Soc.* **1975**, *97*, 3049-3052.
43. Edgar C. Baker, Leo D. Brown and Kenneth N. Raymond, "Structural Characterization of a Chloride-Bridged Lanthanide Cyclopentadienyl Dimer,  $[\text{Yb}(\text{C}_5\text{H}_4\text{CH}_3)_2\text{Cl}]_2$ ," *Inorg. Chem.* **1975**, *14*, 1376-1379.
44. Frances A. Jurnak, Douglas R. Greig and Kenneth N. Raymond, "Structural Characterization of the Pentakis(phenylisocyanide)cobalt(II) Ion in the Salt of  $[\text{Co}(\text{CNC}_6\text{H}_5)_5][\text{ClO}_4]_2\cdot\frac{1}{2}\text{ClCH}_2\text{CH}_2\text{Cl}$ ," *Inorg. Chem.* **1975**, *14*, 2585-2589.
45. Leo D. Brown and Kenneth N. Raymond, "Structural Characterization of the Pentacyanocobaltate(II) Anion in the Salt  $[\text{NEt}_2(\text{i-Pr})_2]_3[\text{Co}(\text{CN})_5]$ ," *Inorg. Chem.* **1975**, *14*, 2590-2594.
46. Leo D. Brown and Kenneth N. Raymond, "A  $\sigma$ -Bonded Dioxygen Adduct of the Pentacyanocobaltate(II) Anion. Crystal Structure of  $[\text{N}(\text{C}_2\text{H}_5)_4]_3[\text{Co}(\text{CN})_5(\text{O}_2)]\cdot 5\text{H}_2\text{O}$ ," *Inorg. Chem.* **1975**, *14*, 2595-2601.
47. Edgar C. Baker, Gordon W. Halstead and Kenneth N. Raymond, "The Structure and Bonding of 4f and 5f Series Organometallic Compounds," in *Structure and Bonding*, Vol. 25, J. D. Dunitz, P. Hemmerich, R. H. Holm, J. A. Ibers, C. K. Jorgensen, J. B. Neilands,

- D. Reinen, R. J. P. Williams, Eds., Springer Verlag, Berlin Heidelberg, New York, **1976**, pp 23-68. [Review](#)
48. Stephan S. Isied, Gilbert Kuo and Kenneth N. Raymond, "Coordination Isomers of Biological Iron Transport Compounds. V. The Preparation and Chirality of the Chromium(III) Enterobactin Complex and Model Tris(catechol)chromium(III) Analogues," *J. Am. Chem. Soc.* **1976**, *98*, 1763-1767.
49. Kenneth N. Raymond, Stephan S. Isied, Leo D. Brown, Frank R. Fronczek and J. Hunter Nibert, "Coordination Isomers of Biological Iron Transport Compounds. VI. Models of the Enterobactin Coordination Site. A Crystal Field Effect in the Structure of Potassium Tris(catecholato)chromate(III) and -ferrate(III) Sesquihydrates,  $K_3[M(O_2C_6H_4)_3] \cdot 1.5H_2O$ ,  $M = Cr, Fe$ ," *J. Am. Chem. Soc.* **1976**, *98*, 1767-1774.
50. Frank R. Fronczek, Gordon W. Halstead and Kenneth N. Raymond, "Actinide Metallo-carborane Complex: Synthesis and X-ray Structure Determination of the Bis[ $\eta^5$ -(3)-1,2-dicarbollyl]dichlorouranium(IV) Dianion," *J. Chem. Soc., Chem. Commun.* **1976**, 279-251.
51. Frank R. Fronczek, Edgar C. Baker, Paul R. Sharp, Kenneth N. Raymond, Helmut G. Alt and Marvin D. Rausch, "The Structures of Dimethylhafnocene and Its Hydrolysis Product,  $\mu$ -Oxo-bis(methylhafnocene)," *Inorg. Chem.* **1976**, *15*, 2284-2289.
52. Frank R. Fronczek, Gordon W. Halstead and Kenneth N. Raymond, "The Synthesis, Crystal Structure, and Reactions of an Actinide Metallo-carborane Complex, Bis( $\eta^5$ -(3)-1,2-dicarbollyl)dichlorouranium(IV) Dianion,  $[U(C_2B_9H_{11})_2C_{12}]^{2-}$ ," *J. Am. Chem. Soc.* **1977**, *99*, 1769-1775.
53. Kamal Abu-Dari and Kenneth N. Raymond, "Coordination Isomers of Biological Iron Transport Compounds. 8. The Resolution of Tris(hydroxamato) and Tris(thiohydroxamato) Complexes of High-Spin Iron(III)," *J. Am. Chem. Soc.* **1977**, *99*, 2003-2005.
54. Kamal Abu-Dari and Kenneth N. Raymond, "Coordination Isomers of Biological Iron-Transport Compounds. 7. Preparation and Resolution of Tris(thiobenzohydroxamato)-chromium(III), -cobalt(III), and (High-Spin)-iron(III) Complexes," *Inorg. Chem.* **1977**, *16*, 807-812.
55. *Bioinorganic Chemistry - II. Advances in Chemistry Series*, No. 162, Raymond, K. N., Ed., American Chemical Society, Washington, D.C., **1977**. [Book](#)
56. Kenneth N. Raymond, "Kinetically Inert Complexes of the Siderophores in Studies of Microbial Iron Transport," reprinted from *Bioinorganic Chemistry - II, Advances in Chemistry Series*, No. 162, K. N. Raymond, Ed., American Chemical Society: Washington, D.C., **1977**, pp 33-54. [Review](#)
57. Edgar C. Baker and Kenneth N. Raymond, "Synthetic, Structural, and Magnetic properties of the Pyrazine-Bridged Lanthanide Organometallic Complex  $\mu$ -Pyrazine-

- bis[tris(cyclo-pentadienide)ytterbium(III)], (C<sub>5</sub>H<sub>5</sub>)<sub>3</sub>Yb(NC<sub>4</sub>H<sub>4</sub>N)Yb(C<sub>5</sub>H<sub>5</sub>)<sub>3</sub>,” *Inorg. Chem.* **1977**, *16*, 2710-2714.
58. Frederick L. Weitzel, Kenneth N. Raymond, William L. Smith and Thomas R. Howard, “Specific Sequestering Agents for the Actinides. 1. N,N',N'',N'''-Tetra(2,3-dihydroxybenzoyl)tetraazacyclotetra- and -hexadecanes,” *J. Am. Chem. Soc.* **1978**, *100*, 1170-1172.
  59. William L. Smith, James D. Ekstrand and Kenneth N. Raymond, “High-Yield Synthesis and Crystal Structure of 1,5,9,13-Tetraazacyclohexadecane ([16]aneN<sub>4</sub>),” *J. Am. Chem. Soc.* **1978**, *100*, 3539-3544.
  60. Carl J. Carrano and Kenneth N. Raymond, “Synthesis and Characterization of Iron Complexes of Rhodotorulic Acid: A Novel Dihydroxamate Siderophore and Potential Chelating Drug,” *J. Chem. Soc., Chem. Commun.* **1978**, 501-502.
  61. Eileen N. Duesler and Kenneth N. Raymond, “The Structures and Conformations of the Mixed Ethylenediamine 1,3-Propanediamine Complexes [Cr(en)<sub>2</sub>(tn)]Br<sub>3</sub>•H<sub>2</sub>O and [Cr(en)(tn)<sub>2</sub>]<sub>3</sub>•H<sub>2</sub>O,” *Inorg. Chimica Acta* **1978**, *30*, 87-95.
  62. Alex Avdeef, Stephen R. Sofen, Thomas L. Bregante and Kenneth N. Raymond. “Coordination Chemistry of Microbial Iron Transport Compounds. 9. Stability Constants for Catechol Models of Enterobactin,” *J. Am. Chem. Soc.* **1978**, *100*, 5362-5370.
  63. Carl J. Carrano and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds. 10. Characterization of the Complexes of Rhodotorulic Acid, a Dihydroxamate Siderophore,” *J. Am. Chem. Soc.* **1978**, *100*, 5371-5374.
  64. Stephen R. Cooper, James V. McArdle and Kenneth N. Raymond, “Siderophore Electrochemistry: Relation to Intracellular Iron Release Mechanism,” *Proc. Natl. Acad. Sci. USA* **1978**, *75*, 3551-3554.
  65. James V. McArdle, Stephen R. Sofen, Stephen R. Cooper and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds. 13. Preparation and Chirality of the Rhodium(III) Enterobactin Complex and Model Tris(catecholato)rhodate(III) Analogues,” *Inorg. Chem.* **1978**, *17*, 3075-3078.
  66. Kamal Abu-Dari, Stephen R. Cooper, and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds. 15. Electrochemistry and Magnetic Susceptibility of Iron(III)-Hydroxamate and -Thiohydroxamate Complexes,” *Inorg. Chem.* **1978**, *17*, 3394-3397.
  67. Carl J. Carrano and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds: Rhodotorulic Acid and Iron Uptake in *Rhodotorula pilimanae*,” *J. Bacteriol.* **1978**, *136*, 69-74.
  68. Stephen R. Sofen, Kamal Abu-Dari, Derek P. Freyberg and Kenneth N. Raymond, “Specific Sequestering Agents for the Actinides. 2. A Ligand Field Effect in the Crystal and Molecular Structures of Tetrakis(catecholato)uranate(IV) and -thorate(IV),” *J. Am. Chem. Soc.* **1978**, *100*, 7882-7887.

69. Kamal Abu-Dari, James D. Ekstrand, Derek P. Freyberg and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 14. Isolation and Structural Characterization of transTris(benzohydroxamato)chromium(III)-2-(2-Propanol)," *Inorg. Chem.* **1979**, *18*, 108-112.
70. Stephen R. Sofen, David C. Ware, Stephen R. Cooper and Kenneth N. Raymond, "Structural, Electrochemical, and Magnetic Properties of a Four-Membered Redox Series ( $[\text{Cr}(\text{L})_3]^{n-}$ ,  $n = 0-3$ ) in Catechol-Benzoquinone Complexes of Chromium," *Inorg. Chem.* **1979**, *18*, 234-239.
71. Carl J. Carrano, Stephen R. Cooper and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 11. Solution Equilibria and Electrochemistry of Ferric Rhodotorulate Complexes," *J. Am. Chem. Soc.* **1979**, *101*, 599-604.
72. Derek P. Freyberg, John L. Robbins, Kenneth N. Raymond and James C. Smart, "Crystal and Molecular Structures of Decamethylmanganocene and Decamethylferrocene. Static Jahn-Teller Distortion in a Metallocene," *J. Am. Chem. Soc.* **1979**, *101*, 892-897.
73. Wesley R. Harris, Frederick L. Weigl and Kenneth N. Raymond, "Synthesis and Evaluation of an Enterobactin Model Compound. 1,3,5-Tris(2,3-dihydroxybenzoylaminomethyl)-benzene and its Iron(III) Complex," *J. Chem. Soc., Chem. Commun.* **1979**, 177-178.
74. Wesley R. Harris, Carl J. Carrano and Kenneth N. Raymond, "Spectrophotometric Determination of the Proton-Dependent Stability Constant of Ferric Enterobactin," *J. Am. Chem. Soc.* **1979**, *101*, 2213-2214.
75. Kenneth N. Raymond and Carl J. Carrano, "Coordination Chemistry and Microbial Iron Transport," *Acc. Chem. Res.* **1979**, *12*, 183-190. [Review](#)
76. Wesley R. Harris, Carl J. Carrano and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 16. Isolation, Characterization, and Formation Constants of Ferric Aerobactin," *J. Am. Chem. Soc.* **1979**, *101*, 2722-2727.
77. Frederick L. Weigl and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 1. Hexadentate O-Bonding N,N',N''-Tris(2,3-dihydroxybenzoyl) Derivatives of 1,5,9-Triazacyclotridecane and 1,3,5-Triaminomethylbenzene," *J. Am. Chem. Soc.* **1979**, *101*, 2728-2731.
78. Kenneth N. Raymond, "The Structure and Bonding of 4f and 5f Series Organometallic Compounds," in *Organometallics of the f-Elements*, T. J. Marks and R. D. Fischer, Eds., D. Reidel Publishing Company: Dordrecht, Holland, **1979**, pp 249-280. [Review](#)
79. Alex Avdeef and Kenneth N. Raymond, "Free Metal and Free Ligand Concentrations Determined from Titrations Using Only a pH Electrode. Partial Derivatives in Equilibrium Studies," *Inorg. Chem.* **1979**, *18*, 1605-1611.
80. Stephen R. Sofen, Stephen R. Cooper and Kenneth N. Raymond, "Crystal and Molecular Structures of Tetrakis(catecholato)hafnate(IV) and -cerate(IV). Further Evidence for a

- Ligand Field Effect in the Structure of Tetrakis(catecholato)uranate(IV),” *Inorg. Chem.* **1979**, *18*, 1611-1616.
81. Kamal Abu-Dari, Kenneth N. Raymond and Derek P. Freyberg, “The Bihydroxide ( $\text{H}_3\text{O}_2^-$ ) Anion. A Very Short, Symmetric Hydrogen Bond,” *J. Am. Chem. Soc.* **1979**, *101*, 3688-3689.
  82. Carl J. Carrano and Kenneth N. Raymond, “Ferric Ion Sequestering Agents. 2. Kinetics and Mechanism of Iron Removal from Transferrin by Enterobactin and Synthetic Tricatechols,” *J. Am. Chem. Soc.* **1979**, *101*, 5401-5404.
  83. Kamal Abu-Dari, Derek P. Freyberg and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds. 18. Crystal and Molecular Structure of Disodium Triethylmethylammonium Tris(thiobenzohydroximato)chromate(III) Hemikis(sodium hydroxide hydrate),  $\text{Na}_2[(\text{C}_2\text{H}_5)_3(\text{CH}_3)\text{N}][\text{Cr}(\text{PhC}(\text{S})=\text{N}(\text{O}))_3] \cdot \frac{1}{2}\text{NaH}_3\text{O}_2 \cdot 18\text{H}_2\text{O}$ ,” *Inorg. Chem.* **1979**, *18*, 2427-2433.
  84. Wesley R. Harris, Carl J. Carrano, Stephen R. Cooper, Stephen R. Sofen, Alex Avdeef, James V. McArdle and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds. 19. Stability constants and Electrochemical Behavior of Ferric Enterobactin and Model Complexes,” *J. Am. Chem. Soc.* **1979**, *101*, 6097-6104.
  85. William L. Smith and Kenneth N. Raymond, “The Oxidation of Uranium(IV) by N-Phenylbenzohydroxamic Acid and the Structure of the Reaction Product: Chlorodioxo-N-phenylbenzohydroxamato-bis(tetrahydrofuran)uranium(VI),” *J. Inorg. Nucl. Chem.* **1979**, *41*, 1431-1436.
  86. Wesley R. Harris and Kenneth N. Raymond, “Ferric Ion Sequestering Agents. 3. The Spectrophotometric and Potentiometric Evaluation of Two New Enterobactin Analogues: 1,5,9-N,N',N''-Tris(2,3-dihydroxybenzoyl)-cyclotriazatridecane and 1,3,5-N,N',N''-Tris(2,3-dihydroxybenzoyl)-triaminomethylbenzene,” *J. Am. Chem. Soc.* **1979**, *101*, 6534-6541.
  87. Frederick L. Weigl, Wesley R. Harris and Kenneth N. Raymond, “Sulfonated Catecholamide Analogues of Enterobactin as Iron Sequestering Agents,” *J. Med. Chem.* **1979**, *22*, 1281-1283.
  88. Derek P. Freyberg, Kamal Abu-Dari and Kenneth N. Raymond, “Coordination Chemistry of Microbial Iron Transport Compounds. 17. Preparation and Structural Characterization of Tris(N-methylthiobenzohydroxamato)-cobalt(III), -chromium(III), -iron(III), and -manganese(III),” *Inorg. Chem.* **1979**, *11*, 3037-3043.
  89. William L. Smith and Kenneth N. Raymond, “Synthesis of Aliphatic Dimeric N-Isopropylhydroxamic Acids and the Crystal and Molecular Structure of N,N'-Dihydroxy-N,N'-diisopropylhexanediamide: A Hydroxamic Acid in the Trans Conformation,” *J. Am. Chem. Soc.* **1980**, *102*, 1252-1255.
  90. Frederick L. Weigl and Kenneth N. Raymond, “Specific Sequestering Agents for the Actinides. 3. Polycatecholate Ligands Derived from 2,3-Dihydroxy-5-sulfobenzoyl Conjugates of Diaza- and Tetraazaalkanes,” *J. Am. Chem. Soc.* **1980**, *102*, 2289-2293.



91. Patricia W. Durbin, E. Sarah Jones, Kenneth N. Raymond and Frederick L. Weigl, "Specific Sequestering Agents for the Actinides. 4. Removal of  $^{238}\text{Pu}(\text{IV})$  from Mice by Sulfonated Tetrameric Catechoyl Amides," *Rad. Res.* **1980**, *81*, 170-187.
92. Kenneth N. Raymond, Kamal Abu-Dari and Stephen R. Sofen, "Stereochemistry of Microbial Iron Transport Compounds," from ACS Symposium Series, No. 119, *Stereochemistry of Optically Active Transition Metal Compounds*, Bodie E. Douglas and Yoshihiko Saito, Eds., American Chemical Society, Washington, D.C., **1980**, pp 133-167. [Review](#)
93. Kamal Abu-Dari and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 20. Crystal and Molecular Structures of Two Salts of *cis*- and *trans*-Tris(benzohydroximato)-chromate(III)," *Inorg. Chem.* **1980**, *19*, 2034-2040.
94. Kenneth N. Raymond and Charles W. Eigenbrot, Jr., "Structural Criteria for the Mode of Bonding of Organoactinides and -lanthanides and Related Compounds," *Acc. Chem. Res.* **1980**, *13*, 276-283.
95. Kenneth N. Raymond, William L. Smith, Frederick L. Weigl, Patricia W. Durbin, E. Sarah Jones, Kamal Abu-Dari, Stephen R. Sofen and Stephen R. Cooper, "Specific Sequestering Agents for the Actinides," reprinted from ACS Symposium Series, No. 131, *Lanthanide and Actinide Chemistry and Spectroscopy*, Norman M. Edelstein, Ed., American Chemical Society, Washington, D.C., **1980**, 143-172. [Review](#)
96. Kenneth N. Raymond, Wesley R. Harris, Carl J. Carrano and Frederick L. Weigl, "The Synthesis, Thermodynamic Behavior, and Biological Properties of Metal-Ion-Specific Sequestering Agents for Iron and the Actinides," reprinted from ACS Symposium Series, No. 140, *Inorganic Chemistry in Biology and Medicine*, Arthur E. Martell, Ed., American Chemical Society, Washington, D.C., **1980**, 313-332. [Review](#)
97. William L. Smith and Kenneth N. Raymond, "1,5,9,13-Tetraazacyclo-hexadecane ([16]aneN<sub>4</sub>)," in *Inorganic Syntheses*, Vol. XX, Daryle H. Busch, Editor-in-Chief, John Wiley & Sons, Inc., New York, **1980**, 109-111. [Review](#)
98. Kenneth N. Raymond and William L. Smith, "Actinide-Specific Sequestering Agents and Decontamination Applications," in *Structure and Bonding*, Vol. 43, J. B. Goodenough, P. Hemmerich, J. A. Ibers, C. K. Jorgensen, J. B. Neilands, D. Reinen and R. J. P. Williams, Eds., Springer-Verlag, Berlin, Heidelberg, **1981**, 159-186. [Review](#)
99. Frederick L. Weigl, Kenneth N. Raymond and Patricia W. Durbin, "Synthetic Enterobactin Analogues. Carboxamido-2,3-dihydroxyterephthalate Conjugates of Spermine and Spermidine," *J. Med. Chem.* **1981**, *24*, 203-206.
100. Paul R. Sharp, Kenneth N. Raymond, James C. Smart and Ronald J. McKinney, "Structure and Bonding of Bis(fulvalene)dinickel," *J. Am. Chem. Soc.* **1981**, *103*, 753-757.
101. K. N. Raymond and V. L. Pecoraro, "Coordination Chemistry," McGraw-Hill Yearbook of Science & Technology, **1981**, 150-153. [Review](#)

102. Thomas P. Tufano, Vincent L. Pecoraro and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. Kinetics of Iron Release from Ferritin to Catechoylamides," *Biochem. Biophys. Acta* **1981**, 668, 420-428.
103. Charles W. Eigenbrot, Jr. and Kenneth N. Raymond, "Synthesis and Crystal Structure of  $UCp_3(C_3H_3N_2)$ . A New Mode of Pyrazolate Bonding," *Inorg. Chem.* **1981**, 20, 1553-1556.
104. Wesley R. Harris, Carl J. Carrano, Vincent L. Pecoraro and Kenneth N. Raymond, "Siderophilin Metal Coordination. 1. Complexation of Thorium by Transferrin: Structure-Function Implications," *J. Am. Chem. Soc.* **1981**, 103, 2231-2237.
105. Wesley R. Harris, Kenneth N. Raymond and Frederick L. Weigl, "Ferric Ion Sequestering Agents. 6. The Spectrophotometric and Potentiometric Evaluation of Sulfonated Tricatecholate Ligands," *J. Am. Chem. Soc.* **1981**, 103, 2667-2675.
106. William L. Smith and Kenneth N. Raymond, "Specific Sequestering Agents for the Actinides. 6. Synthetic and Structural Chemistry of Tetrakis (N-alkylalkanehydroxamato)thorium(IV) Complexes," *J. Am. Chem. Soc.* **1981**, 103, 3341-3349.
107. Stephen M. Moerlein, Michael J. Welch, Kenneth N. Raymond and Frederick L. Weigl, "Tricatecholamide Analogs of Enterobactin as Gallium- and Indium-Binding Radiopharmaceuticals," *J. Nucl. Med.* **1981**, 22, 710-719.
108. Vincent L. Pecoraro, Frederick L. Weigl and Kenneth N. Raymond, "Ferric Ion-Specific Sequestering Agents. 7. Synthesis, Iron-Exchange Kinetics, and Stability Constants of N-Substituted, Sulfonated Catechoylamide Analogues of Enterobactin," *J. Am. Chem. Soc.* **1981**, 103, 5133-5140.
109. Thomas P. Tufano and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 21. Kinetics and Mechanism of Iron Exchange in Hydroxamate Siderophore Complexes," *J. Am. Chem. Soc.* **1981**, 103, 6617-6624.
110. Frederick L. Weigl and Kenneth N. Raymond, "Lipophilic Enterobactin Analogues. Terminally N-Alkylated Spermine/Spermidine Catecholcarboxamides," *J. Org. Chem.* **1981**, 46, 5234-5237.
111. Vincent L. Pecoraro, Wesley R. Harris, Carl J. Carrano and Kenneth N. Raymond, "Siderophilin Metal Coordination. Difference Ultraviolet Spectroscopy of Di-, Tri-, and Tetraivalent Metal Ions with Ethylenebis[(*o*-hydroxyphenyl)glycine]," *Biochemistry* **1981**, 20, 7033-7039.
112. Kenneth N. Raymond, Vincent L. Pecoraro and Frederick L. Weigl, "Design of New Chelating Agents," in *Development of Iron Chelators for Clinical Use*, Arthur E. Martell, W. French Anderson and David G. Badman, Eds., Elsevier/North-Holland, New York, **1981**, 165-187. [Review](#)

113. Kamal Abu-Dari and Kenneth N. Raymond, "Specific Sequestering Agents for the Actinides. 8. Synthesis and Structural Chemistry of Tetrakis(thiohydroxamato)hafnium(IV) in  $\text{Hf}(\text{CH}_3\text{C}_6\text{H}_4(\text{S})\text{N}(\text{O})\text{CH}_3)_4 \cdot \text{C}_2\text{H}_5\text{OH}$ ," *Inorg. Chem.* **1982**, *21*, 1676-1679.
114. K. N. Raymond, M. J. Kappel, V. L. Pecoraro, W. R. Harris, C. J. Carrano, F. L. Weigl and P. W. Durbin, "Specific Sequestering Agents for Actinide Ions," in *Actinides in Perspective*, N. M. Edelstein, Ed., Pergamon Press, Oxford and New York, **1982**, 491-507. [Review](#)
115. K. N. Raymond, V. L. Pecoraro, W. R. Harris and C. J. Carrano, "Actinide Coordination and Discrimination by Human Transferrin," in *Environmental Migration of Long-Lived Radionuclides*, International Atomic Energy Agency, Vienna, **1982**, 571-577. [Review](#)
116. Vincent L. Pecoraro, Geoffrey B. Wong and Kenneth N. Raymond, "Gallium and Indium Imaging Agents. 2. Complexes of Sulfonated Catechoylamide Sequestering Agents," *Inorg. Chem.* **1982**, *21*, 2209-2215.
117. Kenneth N. Raymond and Thomas P. Tufano, "Coordination Chemistry of the Siderophores and Recent Studies of Synthetic Analogues," in *The Biological Chemistry of Iron*, H. Brian Dunford, David Dolphin, Kenneth N. Raymond and Larry Sieker, Eds., D. Reidel Publishing Company, Dordrecht, Holland, **1982**, 85-105. [Review](#)
118. Charles W. Eigenbrot, Jr. and Kenneth N. Raymond, "Organouranium Complexes of Pyrazole and Pyrazolate. Synthesis and X-ray Structures of  $\text{U}(\text{C}_5\text{Me}_5)_2\text{Cl}_2(\text{C}_3\text{H}_4\text{N}_2)$ ,  $\text{U}(\text{C}_5\text{Me}_5)_2\text{Cl}(\text{C}_3\text{H}_4\text{N}_2)$ , and  $\text{U}(\text{C}_5\text{Me}_5)(\text{C}_3\text{H}_3\text{N}_2)_2$ ," *Inorg. Chem.* **1982**, *21*, 2653-2660.
119. Charles W. Eigenbrot, Jr. and Kenneth N. Raymond, "Crystal and Molecular Structure of  $[\text{Nd}(\text{tren})_2(\text{CH}_3\text{CN})](\text{ClO}_4)_3$ ," *Inorg. Chem.* **1982**, *21*, 2867-2870.
120. Stephen M. Moerlein, Michael J. Welch and Kenneth N. Raymond, "Use of Tricatecholamide Ligands to Alter the Biodistribution of Gallium-67: Concise Communication," *J. Nucl. Med.* **1982**, *23*, 501-506.
121. Mary J. Kappel and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 10. Selectivity of Sulfonated Poly(catechoylamides) for Ferric Ion," *Inorg. Chem.* **1982**, *21*, 3437-3442.
122. Stephen R. Cooper, Yun Bai Koh and Kenneth N. Raymond, "Synthetic, Structural, and Physical Studies of Bis(triethylammonium) Tris(catecholato)vanadate(IV), Potassium Bis(catecholato)-oxovanadate(IV), and Potassium Tris(catecholato)vanadate(III)," *J. Am. Chem. Soc.* **1982**, *104*, 5092-5102.
123. Charles W. Eigenbrot, Jr. and Kenneth N. Raymond, "The Synthesis and Characterization of  $(\text{UCp}_3)_2(\text{Pyrazine})$  and  $[\text{U}(\text{MeCp})_3]_2(\text{Pyrazine})$ :  $\pi$ -Bridged Dimers of  $\text{U}^{3+}$ ," *Polyhedron* **1982**, *1*, 417-419.
124. Kenneth N. Raymond, Thomas D. Y. Chung, Vincent L. Pecoraro and Carl J. Carrano, "Iron Removal from Transferrin by Siderophores and Analogues, and Determination of the Number of Bound Tyrosines in Metal Transferrin Complexes," in *The Biochemistry*

- and Physiology of Iron*, Paul Saltman and Jack Hegener, Eds., Elsevier Biomedical, New York, **1982**, 649-662. [Review](#)
125. Susan J. Barclay, Paul E. Riley and Kenneth N. Raymond, "Dihydroxamate Analogues of Rhodotorulic Acid and an Exceptional Dimer: Preparation and Crystal Structure of  $\text{Fe}_2[\text{i-C}_3\text{H}_7\text{N}(\text{O})\text{C}(=\text{O})(-\text{CH}_2-)_5\text{C}(=\text{O})\text{N}(\text{O})-\text{i-C}_3\text{H}_7]_2(\mu\text{-OCH}_3)_2$ ," *J. Am. Chem. Soc.* **1982**, *104*, 6802-6804.
  126. Geoffrey B. Wong, Mary J. Kappel, Kenneth N. Raymond, B. Matzanke and G. Winkelmann, "Coordination Chemistry of Microbial Iron Transport Compounds. 24. Characterization of Coprogen and Ferricrocin, Two Ferric Hydroxamate Siderophores," *J. Am. Chem. Soc.* **1983**, *105*, 810-815.
  127. Steven J. Rodgers and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 11. Synthesis and Kinetics of Iron Removal from Transferrin of Catechoyl Derivatives of Desferrioxamine B," *J. Med. Chem.* **1983**, *26*, 439-442.
  128. Sibylle Heidinger, Volkmar Braun, Vincent L. Pecoraro and Kenneth N. Raymond, "Iron Supply to *Escherichia coli* by Synthetic Analogs of Enterochelin," *J. Bacteriol.* **1983**, *153*, 109-115.
  129. Vincent L. Pecoraro, Geoffrey B. Wong, Thomas A. Kent and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 22. pH-Dependent Mössbauer Spectroscopy of Ferric Enterobactin and Synthetic Analogues," *J. Am. Chem. Soc.* **1983**, *105*, 4617-4623.
  130. Vincent L. Pecoraro, Wesley R. Harris, Geoffrey B. Wong, Carl J. Carrano and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 23. Fourier Transform Infrared Spectroscopy of Ferric Catechoylamide Analogues of Enterobactin," *J. Am. Chem. Soc.* **1983**, *105*, 4623-4633.
  131. Paul E. Riley, Salim F. Haddad and Kenneth N. Raymond, "Preparation of Praseodymium(III) Chloranilate and the Crystal Structures of  $\text{Pr}_2(\text{C}_6\text{Cl}_2\text{O}_4)_3 \cdot 8\text{C}_2\text{H}_5\text{OH}$  and  $\text{Na}_3[\text{C}_6\text{H}_2\text{O}(\text{OH})(\text{SO}_3)_2 \cdot \text{H}_2\text{O}]$ ," *Inorg. Chem.* **1983**, *22*, 3090-3096.
  132. Paul E. Riley, Vincent L. Pecoraro, Carl J. Carrano and Kenneth N. Raymond, "Siderophilin Metal Coordination. 3. Crystal Structures of the the Cobalt(III), Gallium(III), and Copper(II) Complexes of Ethylenebis[*o*-hydroxyphenyl]glycine]," *Inorg. Chem.* **1983**, *22*, 3096-3103.
  133. Kamal Abu-Dari, Susan J. Barclay, Paul E. Riley and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 25. Proton-Dependent Cobalt(III) Spin States. Structure of the Sodium Salt of *trans*-Tris(benzohydroximato)cobaltate(III)," *Inorg. Chem.* **1983**, *22*, 3085-3089.
  134. Paul E. Riley, Kamal Abu-Dari and Kenneth N. Raymond, "Specific Sequestering Agents for the Actinides. 9. Synthesis of Metal Complexes of 1-Hydroxy-2-pyridinone and the Crystal Structure of Tetrakis(1-oxy-2-pyridonato)aquothorium(IV) Dihydrate," *Inorg. Chem.* **1983**, *22*, 3940-3944.

135. Kenneth N. Raymond, Gwen E. Freeman and Mary J. Kappel, "Actinide-Specific Complexing Agents: their Structural and Solution Chemistry," *Inorg. Chem. Acta* **1984**, *94*, 193-204.
136. Brandan A. Borgias, Stephen R. Cooper, Yun Bai Koh and Kenneth N. Raymond, "Synthetic, Structural, and Physical Studies of Titanium Complexes of Catechol and 3,5-Di-*tert*-butylcatechol," *Inorg. Chem.* **1984**, *23*, 1009-1016.
137. Kenneth N. Raymond, Gertraud Müller and Berthold F. Matzanke, "Complexation of Iron by Siderophores. A Review of Their Solution and Structural Chemistry and Biological Function," in *Topics in Current Chemistry*, Vol. 123, F. L. Boschke, Ed., Springer-Verlag, Berlin, Heidelberg, **1984**, 50-102. [Review](#)
138. Susan J. Barclay, Paul E. Riley and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 26. Dimeric Dialkoxo-Bridged Iron(III) Complexes of Linear Dihydroxamate Ligands," *Inorg. Chem.* **1984**, *23*, 2005-2010.
139. Susan J. Barclay, Boi Hanh Huynh and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport Compounds. 27. Dimeric Iron(III) Complexes of Dihydroxamate Analogues of Rhodotorulic Acid," *Inorg. Chem.* **1984**, *23*, 2011-2018.
140. Berthold F. Matzanke, Gertraud I. Müller and Kenneth N. Raymond, "Hydroxamate Siderophore Mediated Iron Uptake in *E. coli*: Stereospecific Recognition of Ferric Rhodotorulic Acid," *Biochem. Biophys. Res. Comm.* **1984**, *121*, 922-930.
141. Patricia W. Durbin, Nylan Jeung, E. Sarah Jones, Frederick L. Weigl and Kenneth N. Raymond, "Specific Sequestering Agents for the Actinides: 10. Enhancement of  $^{238}\text{Pu}$  Elimination from Mice by Poly(catechoylamide) Ligands," *Rad. Res.* **1984**, *99*, 85-105.
142. Ray D. Lloyd, Fred W. Bruenger, Charles W. Mays, David R. Atherton, Craig W. Jones, Glenn N. Taylor, Walter Stevens, Patricia W. Durbin, Nylan Jeung, E. Sarah Jones, Mary J. Kappel, Kenneth N. Raymond and Frederick L. Weigl, "Removal of Pu and Am from Beagles and Mice by 3,4,3-LICAM(C) or 3,4,3-LICAM(S)," *Rad. Chem.* **1984**, *99*, 106-128.
143. Gertraud Müller and Kenneth N. Raymond, "Specificity and Mechanism of Ferrioxamine-Mediated Iron Transport in *Streptomyces pilosus*," *J. Bacteriol.* **1984**, *160*, 304-312.
144. Gertraud Müller, Berthold F. Matzanke and Kenneth N. Raymond, "Iron Transport in *Streptomyces pilosus* Mediated by Ferrichrome Siderophores, Rhodotorulic Acid, and Enantio-Rhodotorulic Acid," *J. Bacteriol.* **1984**, *160*, 313-318.
145. Kenneth N. Raymond and Steven J. Rodgers, "Biomimetic Chemistry," McGraw-Hill *Yearbook of Science and Technology*, New York, **1985**, 93-97. [Review](#)
146. Mary J. Kappel, Heino Nitsche and Kenneth N. Raymond, "Specific Sequestering Agents for the Actinides. 11. Complexation of Plutonium and Americium by Catecholate Ligands," *Inorg. Chem.* **1985**, *24*, 605-611.

147. Robert C. Scarrow, Paul E. Riley, Kamal Abu-Dari, David L. White and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 13. Synthesis, Structures, and Thermodynamics of Complexation of Cobalt(III) and Iron(III) Tris Complexes of Several Chelating Hydroxypyridinones," *Inorg. Chem.* **1985**, *24*, 954-967.
148. Kenneth N. Raymond, David J. Ecker, Larry D. Loomis and Berthold Matzanke, "Structure, Recognition and Transport of Ferric Enterobactin in *E. coli*," *Rev. Port. Quim.* **1985**, *27*, 113-114.
149. Kenneth N. Raymond, "Specific Sequestering Agents for Iron and Actinides," in *Environmental Inorganic Chemistry*, K. J. Irgolic, A. E. Martell, Eds., Proceedings, U.S.-Italy International Workshop on Environmental Inorganic Chemistry, San Miniato, Italy, June 5-10, 1983, VCH Publishers, Inc., Deerfield Beach, Florida, **1985**, 331-347.
150. Gwen E. Freeman and Kenneth N. Raymond, "Synthetic and Structural Chemistry of Gadolinium and Holmium Catecholates," *Inorg. Chem.* **1985**, *24*, 1410-1417.
151. Steven J. Rodgers, Chiu Yuen Ng and Kenneth N. Raymond, "High-Dilution Synthesis of Macrocyclic Polycatecholates," *J. Am. Chem. Soc.* **1985**, *107*, 4094-4095.
152. Mary J. Kappel, Vincent L. Pecoraro and Kenneth N. Raymond, "Lipophilic Enterobactin Analogues. Stabilities of the Gallium and Ferric Ion Complexes of Terminally N-Substituted Catechoylamides," *Inorg. Chem.* **1985**, *24*, 2447-2452.
153. Paul H. Smith and Kenneth N. Raymond, "A Lanthanide-Amine Template Synthesis. Preparation and Molecular Structures of  $\text{Ln}(\text{L})(\text{CH}_3)(\text{CF}_3\text{SO}_3)_3$  [L = 1,9-Bis(2-aminoethyl)-1,4,6,9,12,14-hexaazacyclohexadecane; Ln = La, Yb] and  $\text{La}(\text{en})_4(\text{CH}_3\text{CN})(\text{CF}_3\text{SO}_3)_3$ ," *Inorg. Chem.* **1985**, *24*, 3469-3477.
154. Gertraud Müller, Susan J. Barclay and Kenneth N. Raymond, "The Mechanism and Specificity of Iron Transport in *Rhodotorula pilimanae* Probed by Synthetic Analogs of Rhodotorulic Acid," *J. Biol. Chem.* **1985**, *260*, 13916-13920.
155. Gertraud Müller, Yoshikazu Isowa and Kenneth N. Raymond, "Stereospecificity of Siderophore-mediated Iron Uptake in *Rhodotorula pilimanae* as Probed by Enantiorhodotorulic Acid and Isomers of Chromic Rhodotorulate," *J. Biol. Chem.* **1985**, *260*, 13921-13926.
156. Robert C. Scarrow, David L. White and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 14. 1-Hydroxy-2(1H)-pyridinone Complexes: Properties and Structure of a Novel Fe-Fe Dimer," *J. Am. Chem. Soc.* **1985**, *107*, 6540-6546.
157. Chi-Woo Lee, David J. Ecker and Kenneth N. Raymond, "The pH-Dependent Reduction of Ferric Enterobactin Probed by Electrochemical Methods and Its Implications for Microbial Iron Transport," *J. Am. Chem. Soc.* **1985**, *107*, 6920-6923.
158. H. Metivier, R. Masse, P. W. Durbin and K. N. Raymond, "Promotion by Tetrameric Catechoylamide Ligands and  $\text{CaNa}_3$ -DTPA of the Dissociation *in vitro* of the Pu-Transferrin Complex Formed after Intravenous Injection of Pu-tri-N-Butylphosphate," *Health Phys.* **1985**, *49*, 1302-1305.

159. Raymond, K. N.; Reedijk, J., Eds. "Selective Recognition and Activation of Small Molecules and Metal Ions in Bioinorganic Chemistry," Report from the NATO-Workshop held at Noordwijkerhout, The Netherlands, July 15-19, 1985; NATO: Brussels, **1985**. [Review](#)
160. Riley, P. E.; Pecoraro, V. L.; Carrano, C. J.; Bonadies, J. A.; Raymond, K. N., "X-ray Crystallographic Characterization of a Stepwise, Metal-Assisted Oxidative Decarboxylation: Vanadium Complexes of Ethylenenbis[*o*-hydroxyphenyl]glycine] and Derivatives," *Inorg. Chem.* **1986**, 25, 154-160.
161. Thomas D. Y. Chung, Berthold F. Matzanke, Günther Winkelmann and Kenneth N. Raymond, "Inhibitory Effect of the Partially Resolved Coordination Isomers of Chromic Desferricoprogen on Coprogen Uptake in *Neurospora crassa*," *J. Bacteriol.* **1986**, 165, 283-287.
162. Charles W. Mays, Ray D. Lloyd, Craig W. Jones, Fred W. Bruenger, Glenn N. Taylor, Patricia W. Durbin, David White and Kenneth N. Raymond, "Decorporation of Pu and Am from Beagles with Delayed Injections of 3,4,3-LICAM(C) or Zn-DTPA," *Health Phys.* **1986**, 50, 530-534.
163. Brandan A. Borgias, Glenn G. Hardin and Kenneth N. Raymond, "Characterization and Structure of  $[H_7O_3]^+[As(catecholate)_3] \cdot p$ -Dioxane," *Inorg. Chem.* **1986**, 25, 1057-1060.
164. Kenneth N. Raymond, David J. Ecker, Larry D. Loomis and Berthold Matzanke, "Structure, Recognition and Transport of Ferric Enterobactin in *E. coli*," in *Frontiers in Bioinorganic Chemistry*, ed. by A.V. Xavier, VCH Verlagsgesellschaft mbH, D-6940 Weinheim (Fed. Rep. of Germany) **1986**, 233-235. [Review](#)
165. David J. Ecker, Berthold Matzanke and Kenneth N. Raymond, "Recognition and Transport of Ferric Enterobactin *Escherichia coli*," *J. Bacteriol.* **1986**, 167, 666-673.
166. Berthold Matzanke, David J. Ecker, T. S. Yang, Boi Hanh Huynh, Gertraud Müller, and Kenneth N. Raymond, "*Escherichia coli* Iron Enterobactin Uptake Monitored by Mössbauer Spectroscopy," *J. Bacteriol.* **1986**, 167, 674-680.
167. Susan J. Barclay and Kenneth N. Raymond, "Preparation, Structure and Physical Properties of Dimeric Copper(II) Hydroxamate Complexes,  $Cu_2L_2$  [L = *i*-PrN(O)C(=O)(CH<sub>2</sub>)<sub>n</sub>C(=O)N(O)-*i*-Pr, n=3-10]<sup>1</sup>" *Inorg. Chem.* **1986**, 25, 3561-3566.
168. Suzanne A. Kretchmar and Kenneth N. Raymond, "Biphasic Kinetics and Temperature Dependence of Iron Removal from Transferrin by 3,4-LICAM" *J. Am. Chem. Soc.* **1986**, 108, 6212-6218.
169. Thomas J. McMurry and Kenneth N. Raymond, "Chelation," *1987 McGraw-Hill Yearbook of Science and Technology*, McGraw-Hill Inc., 127-130. [Review](#)
170. Brandan A. Borgias, Susan J. Barclay and Kenneth N. Raymond, "Structural Chemistry of Gallium(III). Crystal Structures of  $K_3[Ga(catecholate)_3] \cdot 1.5H_2O$  and  $[Ga(benzohydroxamate)_3] \cdot H_2O \cdot CH_3CH_2OH$ ," *J. Coord. Chem.* **1986**, 15, 109-123.

171. Salim F. Haddad and Kenneth N. Raymond, "The Structure and Properties of Tetrakis(tironato)cerate(IV),  $\text{Na}_{12}[\text{Ce}(\text{C}_6\text{H}_2\text{O}_2(\text{SO}_3)_2)_4] \cdot 9\text{H}_2\text{O} \cdot 6\text{C}_3\text{H}_7\text{NO}$ ," *Inorg. Chim. Acta* **1986**, *122*, 111-118.
172. Steven J. Rodgers, Chi-Woo Lee, Chiu-Y. Ng and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 15. Synthesis, Solution Chemistry and Electrochemistry of a New Cationic Analog of Enterobactin," *Inorg. Chem.* **1987**, *26*, 1622-1625.
173. Kenneth N. Raymond, Marion E. Cass and Steven L. Evans, "Metal Sequestering Agents in Bioinorganic Chemistry: Enterobactin Mediated Iron Transport in *E. coli* and Biomimetic Applications," *Pure and Appl. Chem.* **1987**, *59*, 771-778.
174. Thomas J. McMurry, Steven J. Rodgers and Kenneth N. Raymond, "Template and Stepwise Syntheses of a Macrobicyclic Catechoylamide Ferric Ion Sequestering Agent," *J. Am. Chem. Soc.* **1987**, *109*, 3451-3453.
175. Thomas J. McMurry, Mir Wais Hosseini, Thomas M. Garrett, F. Ekkehardt Hahn, Zelideth E. Reyes and Kenneth N. Raymond, "Macrobicyclic Iron(III) Sequestering Agents," *J. Am. Chem. Soc.* **1987**, *109*, 7196-7198.
176. David L. White, Patricia W. Durbin, Nylan Jeung and Kenneth N. Raymond, "Specific Sequestering Agents for the Actinides. 16. Synthesis and Initial Biological Testing of Polydentate Oxohydroxypyridinecarboxylate Ligands," *J. Med. Chem.* **1988**, *31*, 11-18.
177. Petra N. Turowski, Steven J. Rodgers, Robert C. Scarrow, and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 18. Two Dihydroxamic Acid Derivatives of EDTA and DTPA," *Inorg. Chem.* **1988**, *27*, 474-481.
178. Paul H. Smith and Kenneth N. Raymond, "The Solid State and Solution Chemistry of Calcium N-(Phosphonomethyl)glycinate," *Inorg. Chem.* **1988**, *27*, 1056-1061.
179. Kenneth N. Raymond, Thomas J. McMurry, and Thomas M. Garrett, "Macrocyclic Catechol-Containing Ligands," *Pure & Appl. Chem.* **1988**, *60*, 545-548.
180. David J. Ecker, Lawrence D. Loomis, Marion E. Cass, and Kenneth N. Raymond, "Substituted Complexes of Enterobactin and Synthetic Analogs as Probes of the Ferric-Enterobactin Receptor in *Escherichia coli*," *J. Am. Chem. Soc.* **1988**, *110*, 2457-2464.
181. Suzanne A. Kretchmar and Kenneth N. Raymond, "Effects of Ionic Strength on Iron Removal from the Monoferric Transferrins," *Inorg. Chem.* **1988**, *27*, 1436-1441.
182. Dao-Hong Zhu, Mary J. Kappel and Kenneth N. Raymond, "Coordination Chemistry of Lanthanide Catecholates," *Inorg. Chimica Acta* **1988**, *147*, 115-121.
183. Suzanne A. Kretchmar, Miguel Teixeira, Boi-Hanh Huynh, and Kenneth N. Raymond, "Mössbauer Studies of Electrophoretically Purified Monoferric and Diferric Human Transferrin," *Biology of Metals* **1988**, *1*, 26-32.



184. Kenneth N. Raymond and Paul H. Smith, "Biomimetic Ligands: Metal Ion Specificity and Encapsulation," *Pure & Appl. Chem.* **1988**, *60*, 1141-1144.
185. Suzanne A. Kretchmar, Zelideth E. Reyes and Kenneth N. Raymond, "The Spectroelectrochemical Determination of the Reduction Potential of Diferric Serum Transferrin," *Biochim. et Biophys. Acta* **1988**, *956*, 85-94.
186. Robert C. Scarrow and Kenneth N. Raymond, "Synthesis of N-Alkyl-3-hydroxy-2(1H)-pyridinones and Coordination Complexes with Iron(III)," *Inorg. Chem.* **1988**, *27*, 4140-4149.
187. Paul H. Smith, Zelideth E. Reyes, Chi-Woo Lee and Kenneth N. Raymond, "Characterization of a Series of Lanthanide Amine Cage Complexes," *Inorg. Chem.* **1988**, *27*, 4154-4165.
188. Scott M. Rocklage, Steven H. Sheffer, William P. Cacheris, Steven C. Quay, F. Ekkehardt Hahn and Kenneth N. Raymond, "Structural and Thermodynamic Characterization of Manganese(II) N,N'-Dipyridoxylethylenediamine-N, N'-diacetate. A Novel Manganese(II) Chelate," *Inorg. Chem.* **1988**, *27*, 3530-3534.
189. Kenneth N. Raymond and Thomas M. Garrett, "Sequestering Agents Specific for High Oxidation State Cations," *Pure and Appl. Chem.* **1988**, *60*, 1807-1816.
190. Thomas M. Garrett, Peter W. Miller and Kenneth N. Raymond, "2,3-Dihydroxyterephthalamides: Highly Efficient Iron(III)-Chelating Agents," *Inorg. Chem.* **1989**, *28*, 128-133.
191. Scott M. Rocklage, William P. Cacheris, Steven C. Quay, F. Ekkehardt Hahn and Kenneth N. Raymond, "Manganese(II) N,N'-Dipyridoxylethylenediamine-N,N'-diacetate 5,5'-Bis(phosphate). Synthesis and Characterization of a Paramagnetic Chelate for Magnetic Resonance Imaging Enhancement," *Inorg. Chem.* **1989**, *28*, 477-485.
192. Marion E. Cass, Thomas M. Garrett and Kenneth N. Raymond, "The Salicylate Mode of Bonding in Protonated Ferric Enterobactin Analogues," *J. Am. Chem. Soc.* **1989**, *111*, 1677-1682.
193. Thomas J. McMurry, Kenneth N. Raymond and Paul H. Smith, "Molecular Recognition and Metal Ion Template Synthesis," *Science* **1989**, *244*, 938-943. [Review](#)
194. Chiu Yuen Ng, Steven J. Rodgers and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 21. Synthesis and Spectrophotometric and Potentiometric Evaluation of Trihydroxamate Analogues of Ferrichrome," *Inorg. Chem.* **1989**, *28*, 2062-2066.
195. Paul H. Smith, F. Ekkehardt Hahn, Alain Hugi and Kenneth N. Raymond, "Crystal Structures of Two Salts of N-(Phosphonomethyl)glycine and Equilibria with Hydrogen and Bicarbonate Ions," *Inorg. Chem.* **1989**, *28*, 2052-2061.
196. Berthold F. Matzanke, Gertraud Müller-Matzanke, and Kenneth N. Raymond, "Siderophore-Mediated Iron Transport," Physical Bioinorganic Chemistry Series, *Iron*

- Carriers and Iron Proteins*, Thomas M. Loehr, Ed., VCH Publishers, New York, **1989**, 1-121. [Review](#)
197. Kenneth N. Raymond, "Template Synthesis of Ligands for Highly Charged Metal Cations," *J. Incl. Phenomena* **1989**, 7, 169-171.
  198. Patricia W. Durbin, David L. White, Nylan Jeung, Frederick L. Weitzl, Linda C. Uhlir, E. Sarah Jones, Fred W. Bruenger and Kenneth N. Raymond, "Chelation of  $^{238}\text{Pu(IV)}$  *in vivo* by 3,4,3-LICAM(C): Effects of Ligand Methylation and pH," *Health Physics* **1989**, 56, 839-855.
  199. Brandan Borgias, Alain D. Hugi and Kenneth N. Raymond, "Isomerization and Solution Structures of Desferrioxamine B Complexes of  $\text{Al}^{3+}$  and  $\text{Ga}^{3+}$ ," *Inorg. Chem.* **1989**, 28, 3538-3545.
  200. Suzanne A. Kretchmar and Kenneth N. Raymond, "Further Evaluation of the Biphasic Kinetics of Iron Removal from Transferrin by 3,4-LICAMS," *Biology of Metals* **1989**, 2, 65-68.
  201. Patricia W. Durbin, Nylan Jeung, Steven J. Rodgers, Petra N. Turowski, Frederick L. Weitzl, David L. White and Kenneth N. Raymond, "Removal of  $^{238}\text{Pu(IV)}$  from Mice by Polycatecholate, -Hydroxamate or -Hydroxypyridinonate Ligands," *Rad. Prot. and Dos.* **1989**, 26, 351-358.
  202. Diane C. Fisher, Susan J. Barclay-Peet, Carol A. Balfé, and Kenneth N. Raymond, "Synthesis and Characterization of Vanadium(V) and -(IV) Hydroxamate Complexes. X-ray Crystal Structures of Oxochlorobis(benzohydroxamato)vanadium(V) and Oxoisopropoxo(N,N'-dihydroxy-N,N'-diisopropylheptanediamido)vanadium(V)," *Inorg. Chem.* **1989**, 28, 4399-4406.
  203. Kamal Abu-Dari, F. Ekkehardt Hahn and Kenneth N. Raymond, "Lead Sequestering Agents. 1. Synthesis, Physical Properties, and Structures of Lead Thiohydroxamate Complexes," *J. Am. Chem. Soc.* **1990**, 112, 1519-1524.
  204. F. Ekkehardt Hahn, Thomas J. McMurry, Alain Hugi and Kenneth N. Raymond, "Coordination Chemistry of Microbial Iron Transport. 42. Structural and Spectroscopic Characterization of Diastereomeric Cr(III) and Co(III) Complexes of Desferriferriothiocin," *J. Am. Chem. Soc.* **1990**, 112, 1854-1860.
  205. A. Ray Bulls, C. Greg Pippin, F. Ekkehardt Hahn and Kenneth N. Raymond, "Synthesis and Characterization of a Series of Vanadium-Tunichrome B1 Analogues. Crystal Structure of a Tris(catecholamide) Complex of Vanadium," *J. Am. Chem. Soc.* **1990**, 112, 2627-2632.
  206. Mark S. Konings, William C. Dow, David B. Love, Kenneth N. Raymond, Steven C. Quay and Scott M. Rocklage, "Gadolinium Complexation by a New DTPA-Amide Ligand. Amide Oxygen Coordination," *Inorg. Chem.* **1990**, 29, 1488-1491.

207. Mario Branca, Giovanni Micera, Alessandro Dessi, Daniele Sanna and Kenneth N. Raymond, "Formation and Structure of the Tris(catecholato)vanadate(IV) Complex in Aqueous Solution," *Inorg. Chem.* **1990**, *29*, 1586-1589.
208. G. N. Stradling, S. A. Gray, J. C. Moody, A. Hodgson, K. N. Raymond, P.W. Durbin, S. J. Rodgers, D. L. White and P. N. Turowski, "The Efficacy of DFO-HOPO, DTPA-DX and DTPA for Enhancing the Excretion of Plutonium and Americium from the Rat," *Int. J. Radiat. Biol.*, **1990**, *59*(5), 1269-1277.
209. Kenneth N. Raymond, "Biomimetic Metal Encapsulation," *Coord. Chem. Reviews* **1990**, *105*, 135-153.
210. Kamal Abu-Dari and Kenneth N. Raymond, "Ferric Ion Sequestering Agents. 23. Synthesis of Tris(hydroxypyridinethione) Ligands and Their Ferric Complexes; X-ray Structure Analysis of N,N',N"-Tris(1,2-didehydro-1-hydroxy-2-thioxopyrid-6-yl)carbonyl)-2,2',2"-triaminotriethylaminato)iron(III)," *Inorg. Chem.* **1991**, *30*, 519-524.
211. Kenneth N. Raymond, "Template Synthesis and Ligand Design for f-Metal Ligands," *Eur. J. Solid State Inorg. Chem.* **1991**, *28*, 225-228.
212. Robert C. Scarrow, David J. Ecker, Chiu Ng, Sylvia Liu and Kenneth N. Raymond, "Iron(III) Coordination Chemistry of Linear Dihydroxyserine Compounds Derived from Enterobactin," *Inorg. Chem.* **1991**, *30*, 900-906.
213. Lawrence D. Loomis and Kenneth N. Raymond, "Solution Equilibria of Enterobactin and Metal-Enterobactin Complexes," *Inorg. Chem.* **1991**, *30*, 906-911.
214. Thomas M. Garrett, Thomas J. McMurry, Mir Wais Hosseini, Zelideth E. Reyes, F. Ekkehardt Hahn, and Kenneth N. Raymond, "Synthesis and Characterization of Macrobicyclic Iron(III) Sequestering Agents," *J. Am. Chem. Soc.* **1991**, *113*, 2965-2977.
215. Timothy B. Karpishin, Matthew S. Gebhard, Edward I. Solomon, and Kenneth N. Raymond, "Spectroscopic Studies of the Electronic Structure of Iron(III) Tris(catecholates)," *J. Am. Chem. Soc.* **1991**, *113*, 2977-2984.
216. Lawrence D. Loomis and Kenneth N. Raymond, "Kinetics of Gallium Removal from Transferrin and Thermodynamics of Gallium-Binding by Sulfonated Tricatechol Ligands," *J. Coord. Chem.* **1991**, *23*, 361-387.
217. C. Allen Chang, Paul F. Sieving, Alan D. Watson, Torin M. Dewey, Timothy B. Karpishin, and Kenneth N. Raymond, "Ionic Versus Nonionic MR Imaging Contrast Media: Operational Definitions," *J. Magnetic Resonance Imaging*, **1992**, *2*, 95-98.
218. T. D. P. Stack, Timothy B. Karpishin, and Kenneth N. Raymond, "Structural and Spectroscopic Characterization of Chiral Ferric Tris-Catecholamides: Unraveling the Design of Enterobactin," *J. Am. Chem. Soc.* **1992**, *114*, 1512-1514.
219. Silvia Konetschny-Rapp, Günther Jung, Kenneth N. Raymond, Johannes Meiwes and Hans Zähler, "Solution Thermodynamics of the Ferric Complexes of New

- Desferrioxamine Siderophores Obtained by Directed Fermentation,” *J. Am. Chem. Soc.*, **1992**, *114*, 2224-2230.
220. Thomas M. Garrett, Marion E. Cass and Kenneth N. Raymond, “Hydrogen Bonding in Catechoylamides,” *J. Coord. Chem.*, **1992**, *25*, 241-253.
221. Timothy B. Karpishin and Kenneth N. Raymond, “The First Structural Characterization of a Metal-Enterobactin Complex: [V(enterobactin)]<sup>2-</sup>,” *Angew. Chem.* **1992**, *104*, 486-488; *Angew. Chemie Int. Edt.*, **1992**, *31*, 466-468.
222. Kamal Abu-Dari and Kenneth N. Raymond, “Synthesis and Characterization of Chiral Isomers of Tris(1-oxo-22(1H)-Pyridinethiones)Iron(III), Chromium(III), and Cobalt(III) Complexes.” *J. Coord. Chem.*, **1992**, *26*, 1-14.
223. Thaddeus S. Franczyk, Kenneth R. Czerwinski, and Kenneth N. Raymond, “Stereognostic Coordination Chemistry. 1. The Design and Synthesis of Chelators for the Uranyl Ion.” *J. Am. Chem. Soc.* **1992**, *114*, 8138-8146.
224. G. N. Stradling, S. A. Gray, M. Ellender, J. C. Moody, A. Hodgson, M. Pearce, I. Wilson, R. Burgada, T. Bailly, Y. G. P. Leroux, D. El Manouni, K. N. Raymond and P. W. Durbin. “The Efficacies of 3,4,3-LIHOPO and DTPA for Enhancing the Excretion of Plutonium and Americium from the Rat: Comparison with Other Siderophore Analogues.” *Int. J. Rad. Biol.* **1992**, *62*, 487-497.
225. Jide Xu, T. D. P. Stack and K. N. Raymond, “An Eight-Coordinate Cage: Synthesis and Structure of the First Macrotricyclic Tetraterephthalamide Ligand.” *Inorg. Chem.* **1992**, *31*, 4903-4905.
226. Timothy B. Karpishin, T. D. P. Stack and Kenneth N. Raymond, “Octahedral vs. Trigonal Prismatic Geometry in a Series of Metal Complexes with a Macrobicyclic Tris(catecholate) Ligand,” *J. Am. Chem. Soc.* **1993**, *115*, 182-192.
227. A. S. Borovik, Torin M. Dewey and Kenneth N. Raymond, “Amidate Ligands for the Oxovanadium(IV) Cation: Design, Synthesis, Structure, and Spectroscopic and Electrochemical Properties,” *Inorg. Chem.* **1993**, *32*, 413-421.
228. Linda C. Uhler, Patricia W. Durbin, Nylan Jeung, and Kenneth N. Raymond, “Specific Sequestering Agents for the Actinides. 21. Synthesis and Initial Biological Testing of Octadentate Mixed Catecholate-Hydroxypyridinonate Ligands.” *J. Med. Chemistry* **1993**, *36*, 504-509.
229. Timothy B. Karpishin, Torin M. Dewey and Kenneth N. Raymond. “The Vanadium(IV) Enterobactin Complex: Structural, Spectroscopic and Electrochemical Characterization.” *J. Am. Chem. Soc.* **1993**, *115*, 1842-1851.
230. Torin M. Dewey, Justin Du Bois, and Kenneth N. Raymond, “Ligands for Oxovanadium(IV): Bis(catecholamide) Coordination and *Inter*-Molecular Hydrogen Bonding to the Oxo Atom.” *Inorg. Chem.* **1993**, *32*, 1729-1738.

231. Kenneth N. Raymond and Patricia W. Durbin. "The Design, Synthesis and Evaluation of Sequestering Agents Specific for Plutonium(IV)." Proceedings of *The First Hanford Separation Science Workshop*, July 23-25, 1991, Richland, Washington. Publication PNL-SA-21775, **1993**. [Review](#)
232. Kamal Abu-Dari, Timothy B. Karpishin, and Kenneth N. Raymond. "Lead Sequestering Agents. 2. Synthesis of Mono- and Bis-(hydroxypyridinethione) Ligands and Their Lead Complexes. Structure of Bis(6-diethylcarbamoyl)-1-hydroxy-2(1*H*)-pyridine-2-thionato-O,S)lead(II)." *Inorg. Chem.* **1993**, 32, 3052-3055.
233. T. D. P. Stack, Zhiguo Hou and Kenneth N. Raymond, "Rational Reduction of the Conformational Space of a Siderophore Analog through Nonbonded Interactions: The Role of Entropy in Enterobactin." *J. Am. Chem. Soc.* **1993**, 115, 6466-6467.
234. Timothy B. Karpishin, T. D. P. Stack and Kenneth N. Raymond, "Stereoselectivity in Chiral FeIII and GaIII Tris(catecholate) Complexes Effected by Nonbonded Weakly Polar Interactions." *J. Am. Chem. Soc.* **1993**, 115, 6115-6125.
235. Suzanne A. Kretchmar Nguyen, Adrienne Craig, and Kenneth N. Raymond, "Transferrin: The Role of Conformational Changes in Iron Removal by Chelators." *J. Am. Chem. Soc.* **1993**, 115, 6758.
236. Thomas D. Y. Chung and Kenneth N. Raymond, "Lactoferrin: The Role of Conformational Changes in Its Iron Binding and Release." *J. Am. Chem. Soc.* **1993**, 115, 6765.
237. G. N. Stradling, S. A. Gray, J. C. Moody, M. J. Pearce, I. Wilson, R. Burgada, T. Bailly, Y. Leroux, K. N. Raymond and P. W. Durbin, "Comparative Efficacies of 3,4,3-LIHOPO and DTPA for Enhancing the Excretion of Plutonium and Americium from the Rat after Simulated Wound Contamination as Nitrates." *Int. J. of Rad. Biol.* **1993**, 64, 133-140. LBL Number 35117.
238. J. L. Poncy, G. Rateau, R. Burgada, T. Bailly, Y. Leroux, K. N. Raymond, P. W. Durbin and R. Masse. "Efficacy of 3,4,3-LIHOPO for Reducing the Retention of <sup>238</sup>Pu in Rats After Inhalation of the Tributyl Phosphate Complex." *Int. J. Rad. Biol.* **1993**, 64, 431-436.
239. V. Volf, R. Burgada, K. N. Raymond and P. W. Durbin, "Early Chelation Therapy for Pu-238 and Am-241 in the Rat: Comparison of 3,4,3-LIHOPO, DFO-HOPO, DTPA-DX, DTPA and DFOA," *Int. J. of Rad. Biol.* **1993**, 63, 785-793.
240. Kenneth N. Raymond and Jide Xu, "Siderophore-based Hydroxypyridonate Sequestering Agents" in *The Development of Iron Chelators for Clinical Use*, R. J. Bergeron and G. M. Brittenham, Eds., CRC Press, Inc.: Boca Raton, FL, **1994**, pp 307-327. [Review](#)
241. Zhiguo Hou, Donald W. Whisenhunt Jr., Jide Xu and Kenneth N. Raymond, "Potentiometric, Spectrophotometric and <sup>1</sup>H NMR Study of Four Desferrioxamine B Derivatives and Their Ferric Complexes." *J. Am. Chem. Soc.* **1994**, 116, 840-847.

242. Elizabeth C. Theil and Kenneth N. Raymond, "Transition-Metal Storage, Transport, and Biomineralization" in *Bioinorganic Chemistry*, I. Bertini, H. Gray, S. Lippard and J. Valentine Eds., University Science Books: Mill Valley, CA, **1994**, pp. 1-37. [Review](#)
243. Kenneth N. Raymond, "Recognition and Transport of Natural and Synthetic Siderophores by Microbes." *Pure and Appl. Chem.* **1994**, *66*, 773-781.
244. Jason R. Telford, Julie A. Leary, Linda M. G. Tunstad, B. Rowe Byers and Kenneth N. Raymond, "Amonabactin: Characterization of a Series of Siderophores from *Aeromonas hydrophila*." *J. Am. Chem. Soc.* **1994**, *116*, 4499.
245. Daniel Heineke, Sonya J. Franklin and Kenneth N. Raymond. "Coordination Chemistry of Glyphosate: Structural and Spectroscopic Characterization of Bis(glyphosate)metal(III) Complexes," *Inorg. Chem.* **1994**, *33*, 2413.
246. Rick Cox, Dario Gomez, Daniel A. Buttry, Peter Bonnesen and Kenneth N. Raymond "High Surface Area Silica Particles as a New Vehicle for Ligand Immobilization on the Quartz Crystal Microbalance," in ACS Symposium Series, No. 561, *Interfacial Design and Chemical Sensing*, Thomas E. Mallouk and D. Jed Harrison, Eds., American Chemical Society, Washington, D.C., **1994**, pp 71-77.
247. P. W. Durbin, B. Kullgren, J. Xu, and K. N. Raymond "In vivo Chelation of Am(III), Pu(IV), Np(V) and U(VI) In Mice by TREN-(Me-3,2-HOPO)," *Rad. Prot. Dosimetry* **1994**, *53*, 305-309. LBL-34569.
248. Rick Cox, Daniel A. Buttry, Peter Bonnesen and Kenneth N. Raymond. "Measuring Trace Uranium," *CHEMTECH* **1994**, *24*, 18-21.
249. Markus Albrecht, Sonya J. Franklin and Kenneth N. Raymond "Macrobicyclic Tris(catecholate ligand) Complexes: Spectroscopy, Electrochemistry and the Structure of  $K_2[(H_2\text{-bicappedTREN}CAM)MoO_2]$ ," *Inorg. Chem.* **1994**, *33*, 5785-5793.
250. Sonya J. Franklin and Kenneth N. Raymond, "Solution Structure and Dynamics of Lanthanide Complexes of the Macrocyclic Polyamino Carboxylate DTPA-dien. NMR Study and Crystal Structures of the Lanthanum(III) and Europium(III) Complexes," *Inorg. Chem.* **1994**, *33*, 5794.
251. S. A. Gray, G. N. Stradling, M. J. Pearce, I. Wilson, J. C. Moody, R. Burgada, P. W. Durbin and K. N. Raymond, "Removal of Plutonium and Americium from the Rat Using 3,4,3-LIHOPO and DTPA after Simulated Wound Contamination: Effect of Delayed Administration and Mass of Plutonium," *Radiat. Prot. Dosim.* **1994**, *53*, 319-22.
252. F. Paquet, J. L. Poncy, G. Rateau, R. Burgada, T. Bailly, Y. Leroux, K. N. Raymond, P. W. Durbin and R. Masse, "Reduction of the Retention of  $^{238}Pu$  Inhaled as the Tributylphosphate Complex in Rats Treated by 3,4,3-LIHOPO," *Radiat. Prot. Dosim.*, **1994** *53*, 323-326.
253. F. Ekkehardt Hahn, Michael Keck and Kenneth N. Raymond, "Catecholate Complexes of Silicon: Synthesis and Molecular and Crystal Structures of  $[Si(cat)_2] \cdot 2THS$  and  $\{Li_2[Si(cat)_3]\} \cdot 3.5dme$  (cat = Catecholate Dianion)," *Inorg. Chem.* **1995**, *34*, 1402.

254. Christine Paul-Roth and Kenneth N. Raymond, "Amide Functional Group Contribution to the Stability of Gadolinium(III) Complexes: DTPA Derivatives," *Inorg. Chem.* **1995**, *34*, 1408-1412.
255. Kenneth N. Raymond and Barbara L. Bryan, "The Coordination Chemistry of Iron in Biological Transport and Storage; Iron Removal *in vivo*," in NATO ASI Series, Vol. 459 *Bioinorganic Chemistry An Inorganic Perspective of Life*. D. P. Kessissoglou, Ed., Kluwer Academic Publishers, The Netherlands, **1995**, pp 13-24. [Review](#)
256. Kenneth N. Raymond and Jason R. Telford, "Siderophore-mediated Iron Transport in Microbes" in NATO ASI Series, Vol. 459 *Bioinorganic Chemistry An Inorganic Perspective of Life*. D. P. Kessissoglou, Ed., Kluwer Academic Publishers, The Netherlands, **1995**, pp 25-37. [Review](#)
257. G. N. Stradling, S. A. Gray, M. J. Pearce, I. Wilson, J. C. Moody, R. Burgada, P. W. Durbin and K. N. Raymond. "Decorporation of Thorium-228 from the Rat by 3,4,3-LIHOPO and DTPA after Simulated Wound Contamination." *Human & Experimental Toxicology* **1995**, *14*, 165-169.
258. Jide Xu, Sonya J. Franklin, Donald W. Whisenhunt Jr. and Kenneth N. Raymond. "Gadolinium Complex of Tris[3-hydroxy-1-methyl-2-oxo-1,2-didehydropyridine-4-carboxamidoethyl]-amine: A New Class of Gadolinium Magnetic Resonance Relaxation Agents." *J. Am. Chem. Soc.* **1995**, *117*, 7245-7246.
259. G. N. Stradling, S. A. Gray, M. J. Pearce, I. Wilson, J. C. Moody, A. Hodgson and K. N. Raymond. "Efficacy of TREN-(Me-3,2-HOPO), 5-LI-(Me-3,2-HOPO) and DTPA for Removing Plutonium and Americium from the Rat after Inhalation and Wound Contamination as Nitrates: Comparison with 3,4,3-LI(1,2-HOPO)." NRPB-M534 Report, January, **1995**.
260. A. S. Borovik, Justin Du Bois and Kenneth N. Raymond "Metal Oxo Cation Receptors: Multi-Mode Coordination to the Dioxoosmium(VI) Cation." *Angew. Chemie.* **1995**, *107*, 1473-1476. Int. Ed. Engl. **1995**, *34*, 1359-1362.
261. Jide Xu, Patricia W. Durbin, Birgitta Kullgren, and Kenneth N. Raymond. "Specific Sequestering Agents for the Actinides. 28. Synthesis and Initial Biological Evaluation of Multidentate 4-Carbamoyl-3-hydroxy-1-methyl-2(1*H*)-pyridinone Ligands for *in vivo* Plutonium(IV) Chelation." *J. Med. Chem.* **1995**, *38*, 2606-2614.
262. Stefan Rupperecht, Sonya Franklin and Kenneth N. Raymond. "Synthesis of Monothiohydroxamic Ligands and Their Lead Complexes. (Structures of N-Methyl-3-pyridothiohydroxamic Acid Bis(N-methyl-3-pyridothiohydroxamato) lead(II)." *Inorg. Chim. Acta* **1995**, *235*, 185-194.
263. F. Paquet, J. L. Poncy, H. Metivier, G. Grillon, P. Fritsch, R. Burgada, T. Bailly, K. N. Raymond and P. W. Durbin. "Efficacy of 3,4,3-LIHOPO for enhancing the excretion of plutonium from rat after simulated wound contamination as a tributyl-*n*-phosphate complex." *Int. J. Radiat. Biol.* **1995**, *68*, 663-668.

264. Shu Ling Wu, Sonya J. Franklin, Kenneth N. Raymond and William DeW. Horrocks, Jr. "Kinetics of the Formation of Macrocyclic Polyaminocarboxylate Ligand Complexes: A Laser-Excited Luminescence Study of the  $\text{Eu}^{3+}$ -dtpa-dien System." *Inorg. Chem.* **1996**, *35*, 162-167.
265. Joseph E. Fowler, Henry F. Schaefer III, and Kenneth N. Raymond. "The  $S_6$  Point Group Conformers of the Hexamethylchalcogens:  $\text{Me}_6\text{S}$ ,  $\text{Me}_6\text{Se}$ , and  $\text{Me}_6\text{Te}$ ." *Inorg. Chem.* **1996**, *35*, 279-281.
266. Paul H. Walton and Kenneth N. Raymond. "Stereognostic Coordination Chemistry 4. The Design and Synthesis of a Selective Uranyl Ion Complexant." *Inorg. Chim. Acta* **1996**, *240*, 593-601.
267. P. W. Durbin, B. Kullgren, N. Jeung, J. Xu, S. J. Rodgers and K. N. Raymond. "Octadentate Catecholamide Ligands for Pu(IV) based on Linear or Preorganized Molecular Backbones." *Human & Experimental Toxicology* **1996**, *15*, 352-360.
268. Zhiguo Hou, Christopher J. Sunderland, Takayuki Nishio and Kenneth N. Raymond, "Preorganization of Ferric Alcaligin,  $\text{Fe}_2\text{L}_3$ , the First Structure of a Ferric Dihydroxamate Siderophore." *J. Am. Chem. Soc.* **1996**, *118*, 5148-5149.
269. Thomas Beissel, Ryan E. Powers and Kenneth N. Raymond "Symmetry-Based Metal Complex Cluster Formation." *Angew. Chem.*, **1996**, *108*, 1166-1170. *Angew. Chem. Int. Ed. Engl.* **1996** *35*, 1084-1086. [Cover article. Subject of a "News and Comment" report in Nature \(1996, 383, 296\).](#)
270. Stefan Rupprecht, Klaus Langemann, Thomas Lügger, James M. McCormick and Kenneth N. Raymond. "Coordination Chemistry of Bis-thiohydroxamic Acids: Synthesis and Characterization of Their Lead(II) Complexes and Stability Constant Determination." *Inorg. Chim. Acta.* **1996**, *243*, 79-90.
271. Berthold Kersting, Jason R. Telford, Michel Meyer and Kenneth N. Raymond. "Gallium(III) Catecholate Complexes as Probes for the Kinetics and Mechanism of Inversion and Isomerization of Siderophore Complexes." *J. Am. Chem. Soc.* **1996**, *118*, 5712-5721.
272. Donald W. Whisenhunt Jr., Mary P. Neu, Zhiguo Hou, Jide Xu, Darleane C. Hoffman, and Kenneth N. Raymond. "Specific Sequestering Agents for the Actinides. 29. Stability of the Thorium(IV) Complexes with Desferrioxamine B (DFO), and Three Octadentate Catecholate or Hydroxypyridionate DFO Derivatives: DFOMTA, DFOCAMC, and DFO-1,2-HOPO; Comparative Stability of the Plutonium(IV) DFOMTA Complex." *Inorg. Chem.* **1996**, *35*, 4128-4136.
273. Berthold Kersting, Michel Meyer, Ryan E. Powers and Kenneth N. Raymond, "Dinuclear Catecholate Helicates: Their Inversion Mechanism." *J. Am. Chem. Soc.* **1996**, *118*, 7221-7222.
274. Jason R. Telford and Kenneth N. Raymond. "Siderophores." In: *Comprehensive Supramolecular Chemistry*; Atwood, J. L., Davies, J. E. D., MacNicol, D. D. and Vogtle, F. Eds.; Elsevier Science Ltd.: Oxford, **1996**, Vol. 1, pp 245-266. [Review](#)



275. Ryan E. Powers, William L. Fuller III and Kenneth N. Raymond "Stereognostic Coordination Chemistry." In *Comprehensive Supramolecular Chemistry*. Atwood, J. L., Davies, J. E. D., MacNicol, D. D. and Vogtle, F. Eds.; Elsevier Science Ltd.: Oxford, **1996**, Vol. 10, pp. 537-555. [Review](#)
276. V. Volf, R. Burgada, K. N. Raymond and P. W. Durbin "Treatment with 3,4,3-LIHOPO of Simulated Wounds Contaminated with Plutonium and Americium in Rat" *Int. J. Radiat. Biol.* **1996**, *70*, 109-114.
277. Klaus Langemann, Daniel Heineke, Stefan Rupprecht and Kenneth N. Raymond "Nordessferriferrithiocin. Comparative Coordination Chemistry of a Prospective Therapeutic Iron Chelating Agent." *Inorg. Chem.* **1996**, *35*, 5663-5673.
278. Vadim V. Romanovski, Donald W. Whisenhunt Jr., Alan C. Veeck, Wendy A. Andersen, Darleane C. Hoffman, Jide Xu, David J. White, and Kenneth N. Raymond. "Potential Agents for Removal of Actinides from Waste Solutions" In proceedings from the International Topical Meeting on Nuclear and Hazardous Waste Management, Seattle, Washington, August 18-23, 1996, Vol. 3, pp. 2330-2334, Seattle, WA, American Nuclear Society, LaGrange Park, IL.
279. Kenneth N. Raymond, Dana L. Caulder, Ryan E. Powers, Thomas Beissel, Michel Meyer and Berthold Kersting. "Coordination Number Incommensurate Cluster Formation." *Proc. Robert A. Welch Found. Conf. on Chem. Res.* **1996**, *40*, 115-129.
280. Patricia W. Durbin, Birgitta Kullgren, Jide Xu and Kenneth N. Raymond. "New Agents for *In Vivo* Chelation of Uranium(VI): Efficacy and Toxicity in Mice of Multidentate Catecholate and Hydroxypyridinonate Ligands." *Health Phys.* **1997**, *72*, 865-879.
281. Dana L. Caulder and Kenneth N. Raymond. "Supramolecular Self-Recognition and Self-Assembly in Gallium(III) Catecholamide Triple Helices." *Angew. Chem. Int. Ed. Engl.* **1997**, *36*, 1439-1442.
282. Zhiguo Hou, T.D.P. Stack, Christopher J. Sunderland, Kenneth N. Raymond. "Enhanced Iron(III) Chelation Through Ligand Predisposition: Syntheses, Structures and Stability of Tris-catecholate Enterobactin Analogs." *Inorg. Chim. Acta.* **1997**, *263*, 341-355.
283. Michel Meyer, Jason R. Telford, Seth M. Cohen, David J. White, Jide Xu, and Kenneth N. Raymond. "High-Yield Synthesis of the Enterobactin Trilactone and Evaluation of Derivative Siderophore Analogs." *J. Am. Chem. Soc.* **1997**, *119*, 10093-10103.
284. Michel Meyer, Berthold Kersting, Ryan E. Powers and Kenneth N. Raymond. "Rearrangement Reactions in Dinuclear Triple Helicates." *Inorg. Chem.* **1997**, *36*, 5179-5191.
285. V. Volf, R. Burgada, K. N. Raymond and P. W. Durbin. "Chelation Therapy by DFO-HOPO and 3,4,3-LIHOPO for Injected Pu-238 and Am-241 in the Rat: Effect of Dosage, Time and Mode of Chelate Administration." *Int. J. Radiat. Biol.* **1996**, *70*, 765-772.

286. Jason R. Telford and Kenneth N. Raymond. "Amonabactin: A Family of Novel Siderophores from a Pathogenic Bacterium." *J. Biol. Inorg. Chem.* **1997**, 2, 750-761.
287. Patricia W. Durbin, Birgitta Kullgren, Jide Xu, Kenneth N. Raymond, Patrick G. Allen, Jerome J. Bucher, Norman M. Edelstein and David K. Shuh. "<sup>237</sup>Neptunium: Oxidation State *In Vivo* and Chelation by Multidentate Catecholate and Hydroxypyridinonate Ligands." *Health Physics* **1998**, 75, 34-50.
288. Seth M. Cohen, Michel Meyer, and Kenneth N. Raymond. "Enterobactin Protonation and Iron Release: Hexadentate Tris-Salicylate Ligands as Models for Triprotonated Ferric Enterobactin." *J. Am. Chem. Soc.* **1998**, 120, 6277-6286.
289. Christian Brückner, Ryan E. Powers and Kenneth N. Raymond, "Symmetry-Driven Rational Design of a Tetrahedral Supramolecular Ti<sub>4</sub>L<sub>4</sub> Cluster." *Angew. Chem. Int. Ed.* **1998**, 37, 1837-1839.
290. Dana L. Caulder, Ryan E. Powers, Tatjana N. Parac and Kenneth N. Raymond. "The Self-Assembly of a Pre-designed Tetrahedral M<sub>4</sub>L<sub>6</sub> Supramolecular Cluster." *Angew. Chem. Int. Ed.* **1998**, 37, 1840-1843.
291. Tatjana N. Parac, Dana L. Caulder, and Kenneth N. Raymond, "Selective Encapsulation of Aqueous Cationic Guests into a Supramolecular Tetrahedral [M<sub>4</sub>L<sub>6</sub>]<sup>12-</sup> Anionic Host." *J. Am. Chem. Soc.* **1998**, 120, 8003-8004.
292. Rolf W. Saalfrank, Verena Seitz, Dana L. Caulder, Kenneth N. Raymond, Markus Teichert, Dietmar Stalke. "Self-assembly of {2}-Metallacryptands and {2}-Metallacryptates." *Eur. J. Inorg. Chem.* **1998**, 1313-1317.
293. Jason R. Telford and Kenneth N. Raymond "Coordination Chemistry of the Amonabactins, Bis(catecholate) Siderophores from *Aeromonas hydrophila*." *Inorg. Chem.* **1998** 37, 4578-4583.
294. Kenneth N. Raymond and James M. McCormick. "The Significance and Relationship of Correlation Coefficients for Stepwise Formation Constants (K) and Cumulative Formation Constants (β)." *J. Coord. Chem.* **1998**, 46, 51-57.
295. Stefan König, Christian Brückner, Kenneth N. Raymond and Julie A. Leary, "ESI-ITMS of a Tetrahedral Supramolecular Ti<sub>4</sub>L<sub>4</sub> Cluster." *J. Am. Soc. Mass. Spec.* **1998**, 9, 1099-1103.
296. P. W. Durbin, B. Kullgren, J. Xu and K. N. Raymond. "Development of Decorporation Agents for the Actinides." *Radiation Protection Dosimetry* **1998**, 79, 433-443. [Review](#)
297. Zhiguo Hou, Kenneth N. Raymond, Brendon O'Sullivan, Todd W. Esker and Takayuki Nishio. "A Preorganized Siderophore: Thermodynamic and Structural Characterization of Alcaligin and Bisucaberin, Microbial Macrocyclic Dihydroxamate Chelating Agents." *Inorg. Chem.* **1998**, 37, 6630-6637.
298. Padmamalini Thulasiraman, Salete M. C. Newton, Jide Xu, Kenneth N. Raymond, Christine Mai, Angela Hall, Marjorie A. Montague and Phillip E. Klebba. "Selectivity of

- Ferric Enterobactin Binding and Cooperativity of Transport in Gram-Negative Bacteria.” *J. Bacteriol.* **1998**, *180*, 6689-6696.
299. Christian Brückner, Dana L. Caulder and Kenneth N. Raymond. “Preparation and Structural Characterization of Nickel(II) Catecholates.” *Inorg. Chem.* **1998**, *37*, 6759-6764.
300. Jide Xu and Kenneth N. Raymond. “Uranyl Sequestering Agents: Correlation of Properties and Efficacy with Structure for  $\text{UO}_2^{2+}$  Complexes of Linear Tetradentate 1-Methyl-3-Hydroxy-2(1H)-Pyridinone Ligands.” *Inorg. Chem.* **1999**, *38*, 308-315.
301. Thomas Beissel, Ryan E. Powers, Tatjana N. Parac, and Kenneth N. Raymond. “Dynamic Isomerization of a Supramolecular Tetrahedral  $\text{M}_4\text{L}_6$  Cluster.” *J. Am. Chem. Soc.* **1999**, *121*, 4200-4206.
302. Vadim V. Romanovski, David J. White, Jide Xu, Darleane C. Hoffman, and Kenneth N. Raymond. “Plutonium(IV) and Plutonium(VI) Extraction by 1,2-Hydroxypyridinone-6-N-Octyl Carboxamide.” *Solv. Extr. Ion Exch.* **1999**, *17*, 55-71.
303. Dana L. Caulder and Kenneth N. Raymond. “The Rational Design of High Symmetry Coordination Clusters.” *J. Chem. Soc., Dalton Trans.* **1999**, *8*, 1185-1200. [Cover article](#).
304. Xiankai Sun, Darren W. Johnson, Dana L. Caulder, Ryan E. Powers, Kenneth N. Raymond, and Edward H. Wong. “Exploiting Incommensurate Symmetry Numbers: Rational Design and Assembly of  $\text{M}_2\text{M}'_3\text{L}_6$  Supramolecular Clusters with  $\text{C}_{3h}$  Symmetry.” *Angew. Chem. Int. Ed. Engl.* **1999**, *38*, 1303-1307.
305. Xiangdong Feng, L. Rao, Thomas R. Mohs, Jide Xu, Y. Xia, Glen E. Fryxell, Jun Liu, Kenneth N. Raymond. “Self-Assembled Monolayers on Mesoporous Silica, A Super Sponge for Actinides.” In *Environmental Issues and Waste Management Technologies in the Ceramic and Nuclear Industries IV*, Ceramic Transactions, Vol. 93, James C. Marra and Gregory T. Chandler, Eds.; The American Ceramic Society, Ohio; 1999, p. 35-42.
306. Markus Scherer, Dana L. Caulder, Darren W. Johnson and Kenneth N. Raymond. “Triple Helicate—Tetrahedral Cluster Interconversion Controlled by Host-Guest Interactions.” *Angew. Chem. Int. Ed. Engl.* **1999**, *38*, 1588-1592.
307. Seth M. Cohen, Stéphane Petoud, and Kenneth N. Raymond. “A Novel Salicylate-based Macrobicycle with a *Split Personality*.” *Inorg. Chem.* **1999**, *38*, 4522-4529.
308. Jide Xu, Tatjana N. Parac and Kenneth N. Raymond. “*Meso* Myths: What Drives Assembly of Helical versus *Meso*  $\text{M}_2\text{L}_3$  Clusters?” *Angew. Chem. Int. Ed. Engl.* **1999**, *38*, 2878-2882.
309. Darren W. Johnson, Jide Xu, Rolf W. Saalfrank, Kenneth N. Raymond. “Self Assembly of a Three Dimensional  $\text{Ga}_6\text{L}_6$  Metal Ligand ‘Cylinder.’” *Angew. Chem. Int. Ed. Engl.* **1999**, *38*, 2882-2885.

310. Dana L. Caulder and Kenneth N. Raymond. "Supermolecules by Design." *Accounts of Chemical Research* **1999**, *32*, 975-982. [Cover article](#). [Review](#)
311. Stephan M. Kraemer, Sing-Foong Cheah, Rita Zapf, Jide Xu, Kenneth N. Raymond and Garrison Sposito, "Effect of Hydroxamate Siderophores on Fe Release and Pb(II) Adsorption by Goethite." *Geochimica et Cosmochimica Acta* **1999**, *63*, 3003-3008.
312. Pihong Zhao, Vadim V. Romanovski, Donald W. Whisenhunt, Jr., Darleane C. Hoffman, Thomas R. Mohs, Jide Xu and Kenneth N. Raymond. "Extraction of Plutonium by Chelating Hydroxypyridone and Catecholamide Resins." *Solvent Extraction and Ion Exchange* **1999**, *17*, 1327-1353.
313. F. Paquet, B. Montègue, E. Ansoborlo, M-H. Hengé-Napoli, P. Houpert, P. W. Durbin and K. N. Raymond. "Efficacy of 3,4,3-LIHOPO for Reducing Neptunium Retention in Rat After Simulated Wound Contamination." *Int. J. Radiat. Biol.* **2000**, *76*, 113-117.
314. Alain Stintzi and Kenneth N. Raymond. "Amonabactin Mediated Iron Acquisition from Transferrin and Lactoferrin by *Aeromonas hydrophila*. Direct Measurement of Individual Microscopic Rate Constants." *J. Biol. Inorg. Chem.* **2000**, *5*, 57-66.
315. Patricia W. Durbin, Birgitta Kullgren, Jide Xu and Kenneth N. Raymond. "Multidentate Hydroxypyridinonate Ligands for Pu(IV) Chelation in vivo: Comparative Efficacy and Toxicity in Mouse of Ligands Containing 1,2-HOPO or Me-3,2,-HOPO." *Int. J. Radiat. Biol.* **2000**, *76*, 199-214.
316. Robert A. Yokel, Andrea M. Fredenburg, Patricia W. Durbin, Jide Xu, Mary Kay Rayens and Kenneth N. Raymond. "The Hexadentate Hydroxypyridinonate TREN-(Me-3,2-HOPO) is a More Orally Active Iron Chelator than its Bidentate Analogue." *J. Pharm. Sci.* **2000**, *89*, 545-555.
317. Tatjana N. Parac, Markus Scherer and Kenneth N. Raymond. "Host within a Host: Encapsulation of Alkali Ion-Crown Ether Complexes into a [Ga<sub>4</sub>L<sub>6</sub>]<sup>12-</sup> Supramolecular Cluster." *Angew. Chem. Int. Ed.* **2000**, *39*, 1239-1242.
318. Patricia W. Durbin, Birgitta Kullgren, Shirley N. Ebbe, Jide Xu and Kenneth N. Raymond. "Chelating Agents for Uranium (VI): 2. Efficacy and Toxicity of Tetradentate Catecholate and Hydroxypyridinonate Ligands in Mice." *Health Physics* **2000**, *78*, 511-521.
319. Brendon O'Sullivan, Jide Xu and Kenneth N. Raymond. "New Multidentate Chelators for Iron" in *Iron Chelators: New Development Strategies*; Saratoga Publishing Group, Ponte Vedra, FL, 2000; pp. 177-208.
320. Adam R. Johnson, Brendon O'Sullivan and Kenneth N. Raymond, "Synthesis of a Ligand Based upon a New Entry into the 3-Hydroxy-N-alkyl-2(1H)-pyridinone Ring System and Thermodynamic Evaluation of Its Gadolinium Complex." *Inorg. Chem.* **2000**, *39*, 2652-2660.

321. Seth M. Cohen and Kenneth N. Raymond. "Catecholate/Salicylate Heteropodands: Demonstration of a Catecholate to Salicylate Coordination Change." *Inorg. Chem.* **2000**, *39*, 3624-3631.
322. Jide Xu, Emil Radkov, Marco Ziegler, and Kenneth N. Raymond. "Plutonium(IV) Sequestration: Structural and Thermodynamic Evaluation of the Extraordinarily Stable Cerium(IV) Hydroxypyridinonate Complexes." *Inorg. Chem.* **2000**, *39*, 4156-4164.
323. Jide Xu and Kenneth N. Raymond, "Lord of the Rings: An Octameric Lanthanum Pyrazolonate Cluster." *Angew. Chem. Int. Ed.* **2000**, *39*, 2745-2747.
324. Alain Stintzi, Carmen Barnes, Jide Xu and Kenneth N. Raymond, "Microbial Iron Transport via a Siderophore Shuttle: A Membrane Ion Transport Paradigm," *Proc. Natl. Acad. Sci. USA* **2000**, *97*, 10691-10696.
325. Seth M. Cohen, Brendon O'Sullivan and Kenneth N. Raymond. "Mixed Hydroxypyridinonate Ligands as Iron Chelators." *Inorg. Chem.* **2000**, *39*, 4339-4346.
326. Isabelle Turcot, Alain Stintzi, Jide Xu and Kenneth N. Raymond. "Fast Biological Iron Chelators: Kinetics of Iron Removal from Human Diferric Transferrin by Multidentate Hydroxypyridonates." *J. Biol. Inorg. Chem* **2000**, *5*, 634-641.
327. Cathy Sprencel, Zhenghua Cao, Zengbiao Qi, Daniel C. Scott, Marjorie A. Montague, Nora Ivanoff, Jide Xu, Kenneth N. Raymond, Salet M. C. Newton, and Phillip E. Klebba, "Binding of Ferric Enterobactin by the Escherichia coli Periplasmic Protein FepB." *J. Bacteriol.* **2000**, *182*, 5359-5364.
328. Sharad Hajela, Mauro Botta, Sabrina Giraud, Jide Xu, Kenneth N. Raymond, and Silvio Aime, "A Tris-hydroxymethyl-Substituted Derivative of Gd-TREN-Me-3,2-HOPO: An MRI Relaxation Agent with Improved Efficiency." *J. Am. Chem. Soc.* **2000**, *122*, 11228-11229.
329. Seth M. Cohen, Jide Xu, Emil Radkov, Kenneth N. Raymond, Mauro Botta, Alessandro Barge and Silvio Aime. "Syntheses and Relaxation Properties of Mixed Gadolinium Hydroxypyridinonate MRI Contrast Agents." *Inorg. Chem.* **2000**, *39*, 5747-5756.
330. Marco Ziegler, Julia L. Brumaghim and Kenneth N. Raymond, "Stabilization of a Reactive Cationic Species by Supramolecular Encapsulation." *Angew. Chem. Int. Ed.* **2000**, *39*, 4119-4121.
331. Seth M. Cohen, Stéphane Petoud and Kenneth N. Raymond, "Synthesis and Metal Binding Properties of Salicylate-, Catecholate-, and Hydroxypyridinonate-Functionalized Dendrimers." *Chem. Eur. J.* **2001**, *7*, 272-279.
332. Andreas J. Terpin, Marco Ziegler, Darren W. Johnson and Kenneth N. Raymond, "Resolution and Kinetic Stability of a Chiral Supramolecular Assembly Made of Labile Components." *Angew Chem. Int. Ed.* **2001**, *40*, 157-160.

333. Marco Ziegler, JJ Miranda, Ulla N. Andersen, Darren W. Johnson, Julie A. Leary, and Kenneth N. Raymond. "Combinatorial Libraries of Metal-Ligand Assemblies with an Encapsulated Guest Molecule." *Angew. Chem. Int. Ed.* **2001**, *40*, 733-736.
334. Xiankai Sun, Darren W. Johnson, Dana L. Caulder, Kenneth N. Raymond and Edward H. Wong. "Rational Design and Assembly of  $M_2M_3L_6$  Supramolecular Clusters with  $C_{3h}$  Symmetry by Exploiting Incommensurate Symmetry Numbers." *J. Am. Chem. Soc.* **2001**, *123*, 2752-2763.
335. Robert M. Yeh, Marco Ziegler, Darren W. Johnson, Andreas J. Terpin and Kenneth N. Raymond. "Imposition of Chirality in a Dinuclear Triple-Stranded Helicate by Ion Pair Formation," *Inorg. Chem.* **2001**, *40*, 2216-2217.
336. Sharad P. Hajela, Adam R. Johnson, Jide Xu, Christopher J. Sunderland, Seth M. Cohen, Dana L. Caulder and Kenneth N. Raymond. "Synthesis of Homochiral Tris(2-alkyl-2-aminoethyl)amine Derivatives from Chiral  $\alpha$ -Amino Aldehydes and Their Application in the Synthesis of Water Soluble Chelators." *Inorg. Chem.* **2001**, *40*, 3208-3216.
337. Benjamin P. Hay, David A. Dixon, Rubicelia Vargas, Jorge Garza and Kenneth N. Raymond. "Structural Criteria for the Rational Design of Selective Ligands. 3. Quantitative Structure-Stability Relationship for Iron(III) Complexation by Tris-Catecholamide Siderophores." *Inorg. Chem.* **2001**, *40*, 3922-3935.
338. Xiankai Sun, Darren W. Johnson, Kenneth N. Raymond and Edward H. Wong. "A Silver-linked Supramolecular Cluster Encapsulating a Cesium Cation." *Inorg. Chem.* **2001**, *40*, 4504-4506.
339. Christine J. Gramer and Kenneth N. Raymond. "A Streamlined Synthesis for 2,3-Dihydroxyterephthalamides." *Org. Lett.* **2001**, *3*, 2827-2830.
340. Dana L. Caulder, Christian Brückner, Ryan E. Powers, Stefan König, Tatjana N. Parac, Julie A. Leary and Kenneth N. Raymond, "Design, Formation and Properties of Tetrahedral  $M_4L_4$  and  $M_4L_6$  Supramolecular Clusters." *J. Am. Chem. Soc.* **2001**, *123*, 8923-8938.
341. Darren W. Johnson and Kenneth N. Raymond. "The Self-Assembly of a  $Ga_4L_6^{12-}$  Tetrahedral Cluster *Thermodynamically* Driven by Host-Guest Interactions." *Inorg. Chem.* **2001**, *40*, 5157-5161. [Cover article](#).
342. Darren W. Johnson and Kenneth N. Raymond, "The Role of Guest Molecules in the Self-Assembly of Metal-ligand Clusters." *Supramolecular Chemistry* **2001**, *13*, 639-659. [Cover article](#).
343. Dan M. J. Doble, Mauro Botta, Jay Wang, Silvio Aime, Alessandro Barge and Kenneth N. Raymond. "Optimization of the Relaxivity of MRI Contrast Agents: Effect of Poly(ethylene glycol) Chains on the Water Exchange Rates of  $Gd^{III}$  Complexes." *J. Am. Chem. Soc.* **2001**, *123*, 10758-10759.

344. Alain Stintzi and Kenneth N. Raymond. "Siderophore Chemistry" in *Molecular and Cellular Iron Transport*, D. E. Templeton, Ed.; Marcel Dekker, Inc.; New York, 2001; pp. 273-319. [Review](#)
345. Lo, L. C.; Clarke-Jurchen, K.; Vichinsky, E.; Raymond, K. N.; Watson, G., TMH-ferrocene induced iron overload in the murine model best mimics thalassemia major - A comparison of four iron overloading methods. *Blood* **2001**, *98*, 2068.
346. Christopher J. Sunderland, Mauro Botta, Silvio Aime and Kenneth N. Raymond. "6-Carboxamido-5,4-Hydroxypyrimidinones: A New Class of Heterocyclic Ligands and Their Evaluation as Gadolinium Chelating Agents." *Inorg. Chem.* **2001**, *40*, 6746-6756.
347. Claudio Coccozza, Calvin C. G. Tsao, Sing-Foong Cheah, Stephan M. Kraemer, Kenneth N. Raymond, Teodoro M. Miano and Garrison Sposito. "Temperature Dependence of Goethite Dissolution Promoted by Trihydroxamate Siderophores." *Geochim. Cosmochim. Acta* **2002**, *66*, 431-438.
348. Rolf W. Saalfrank, Horst Glaser, Bernhard Demleitner, Frank Hampel, Mubarik M. Chowdhry, Volker Schünemann, Alfred X. Trautwein, Gavin B. M. Vaughan, Robert Yeh, Anna V. Davis and Kenneth N. Raymond. "Self-Assembly of Tetrahedral and Trigonal Antiprismatic Clusters  $[\text{Fe}_4(\text{L}^4)_4]$  and  $[\text{Fe}_6(\text{L}^5)_6]$  on the Basis of Trigonal Tris-Bidentate Chelators, *Chem. Eur. J.* **2002**, *8*, 493-497. [Cover article](#).
349. Martin E. Bluhm, Sanggoo S. Kim, Emily A. Dertz and Kenneth N. Raymond. "Corynebactin and Enterobactin: Related Siderophores of Opposite Chirality." *J. Am. Chem. Soc.* **2002**, *124*, 2436-2437.
350. Stephan M. Kraemer, Jide Xu, Kenneth N. Raymond and Garrison Sposito. "Adsorption of Pb(II) and Eu(III) by Oxide Minerals in the Presence of Natural and Synthetic Hydroxamate Siderophores." *Environ. Sci. Technol.* **2002**, *36*, 1287-1291.
351. Anna V. Davis, Robert M. Yeh and Kenneth N. Raymond, "Supramolecular Assembly Dynamics." *Proc. Natl. Acad. Sci. USA* **2002**, *99*, 4793-4796. [A perspective in a PNAS special issue devoted to supramolecular chemistry and co-edited by Kenneth N. Raymond.](#)
352. Carmen M. Barnes, Elizabeth C. Theil and Kenneth N. Raymond. "Iron Uptake in Ferritin is Blocked by Binding of  $[\text{Cr}(\text{TREN})(\text{H}_2\text{O})(\text{OH})^{2+}]$ , a Slow Dissociating Model for  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ ." *Proc. Natl. Acad. Sci. USA* **2002**, *99*, 5195-5200.
353. Jide Xu, Patricia W. Durbin, Birgitta Kullgren, Shirley N. Ebbe, Linda C. Uhlir and Kenneth N. Raymond. "Synthesis and Initial Evaluation for In Vivo Chelation of Pu(IV) of a Mixed Octadentate Spermine-Based Ligand Containing 4-Carbamoyl-3-hydroxy-1-methyl-2(1H-pyridinone) and 6-Carbamoyl-1-hydroxy-2(1H)-pyridinone." *J. Med. Chem.* **2002**, *45*, 3963-3971.
354. Martin E. Bluhm, Benjamin P. Hay, Sanggoo S. Kim, Emily A. Dertz and Kenneth N. Raymond. "Corynebactin and a Serine Trilactone Based analogue: Chirality and Molecular Modeling of Ferric Complexes." *Inorg. Chem.* **2002**, *41*, 5475-5478.

355. J. David Van Horn, Christine J. Gramer, Brendon O'Sullivan, Kristy M. Clarke Jurchen, Daniel J. Doble and Kenneth N. Raymond. "Iron(III) 2,3-Dihydroxyterephthalamides Revisited. Charge Effects on Highly Stable Ferric Complexes." *C. R. Chimie* **2002**, *5*, 395-404.
356. David H. Goetz, Margaret A. Holms, Niels Borregaard, Martin E. Bluhm, Kenneth N. Raymond and Roland K. Strong, "The Neutrophil Lipocalin NGAL is a Bacteriostatic Agent that Interferes with Siderophore-Mediated Iron Acquisition." *Mol. Cell* **2002**, *10*, 1033-1043. [Cover article](#).
357. Jide Xu, Brendon O'Sullivan and Kenneth N. Raymond. "Hexadentate Hydroxypyridonate Iron Chelators Based on TREN-Me-3,2-HOPO: Variation of Cap Size." *Inorg. Chem.* **2002**, *41*, 6731-6742.
358. Jurchen, K. M.; Lo, L.; Xu, J. D.; Watson, G.; Raymond, K. N., "Multidentate hydroxypyridinone chelators in an iron-overloaded mouse model." *Blood* **2002**, *100*, 1729.
359. Carmen M. Barnes, Stephane Petoud, Seth M. Cohen and Kenneth N. Raymond. "Competition Studies in Horse Spleen Ferritin Probed by a Kinetically Inert Inhibitor,  $[\text{Cr}(\text{TREN})(\text{H}_2\text{O})(\text{OH})]^{2+}$ , and a Highly Luminescent Tb(III) Reagent." *J. Biol. Inorg. Chem.* **2003**, *8*, 195-205.
360. Marco Ziegler, Anna V. Davis, Darren W. Johnson and Kenneth N. Raymond. "Supramolecular Chirality: A Reporter of Structural Memory." *Angew. Chem. Int. Ed.* **2003**, *42*, 665-668. [Subject of a Nature Materials commentary \(2003, 2, 216\)](#) and a [Chemical and Engineering News article \(2003, 81, 16\)](#).
361. Kenneth N. Raymond, Emily A. Dertz and Sanggoo S. Kim. "Enterobactin – an Archetype for Microbial Iron Transport." *Proc. Nat. Acad. Sci. USA* **2003**, *100*, 3584-3588. [A perspective in a special issue of PNAS devoted to bioinorganic chemistry and co-edited by Kenneth N. Raymond. Special Feature editorial: Jack Halpern and Kenneth N. Raymond, "At the interface of inorganic chemistry and biology," Proc. Nat. Acad. Sci. 2003, 100, 3562.](#)
362. Brendon O'Sullivan, Dan M. J. Doble, Marlon K. Thompson, Carsten Siering, Jide Xu, Mauro Botta, Silvio Aime and Kenneth N. Raymond. "The Effect of Ligand Scaffold Size on the Stability of Tripodal Hydroxypyridonate Gadolinium Complexes." *Inorg. Chem.* **2003**, *42*, 2577-2583.
363. Jide Xu, Donald W. Whisenhunt, Jr., Alan C. Veeck, Linda C. Uhlir and Kenneth N. Raymond. "Thorium(IV) Complexes of Bidentate Hydroxypyridinonates." *Inorg. Chem.* **2003**, *42*, 2665-2674.
364. Anita C. G. Chua, Helen A. Ingram, Kenneth N. Raymond and Erica Baker. "Multidentate Pyridinones Inhibit the Metabolism of Nontransferrin-bound Iron by Hepatocytes and Hepatoma Cells." *Eur. J. Biochem.* **2003**, *270*, 1689-1698.
365. Dan M. J. Doble, Marco Melchior, Brendon O'Sullivan, Carsten Siering, Jide Xu, Valerie C. Pierre and Kenneth N. Raymond. "Toward Optimized High-Relaxivity MRI



- Agents: The Effect of Ligand Basicity on the Thermodynamic Stability of Hexadentate Hydroxypyridonate/Catecholate Gadolinium(III) Complexes.” *Inorg. Chem.* **2003**, *42*, 4930-4937.
366. Patricia W. Durbin, Birgitte Kullgren, Jide Xu, Kenneth N. Raymond, Marie-Hélène Hengè-Napoli, Theodorine Bailly and Ramon Burgada. “Octadentate Hydroxypyridinonate (HOPO) Ligands for Plutonium (IV): Pharmacokinetics and Oral Efficacy.” *Rad. Prot. Dosim.* **2003**, *105*, 503-508.
367. Julia L. Brumaghim and Kenneth N. Raymond. “What Should Be Impossible: Resolution of the Mononuclear Gallium Coordination Complex, Tris(benzohydroxamato)gallium(III).” *J. Am. Chem. Soc.* **2003**, *125*, 12066-12067.
368. Raymond A. Guilmette, R. Hakimi, Patricia W. Durbin, Jide Xu and Kenneth N. Raymond, “Competitive Binding of Pu and Am with Bone Mineral and Novel Chelating Agents.” *Rad. Prot. Dosim.* **2003**, *105*, 527-534.
369. Stéphane Petoud, Seth M. Cohen, Jean-Claude G. Bünzli and Kenneth N. Raymond. “Stable Lanthanide Luminescence Agents Highly Emissive in Aqueous Solution: Multidentate 2-Hydroxyisophthalamide Complexes of Sm<sup>3+</sup>, Eu<sup>3+</sup>, Tb<sup>3+</sup>, Dy<sup>3+</sup>.” *J. Am. Chem. Soc.* **2003**, *125*, 13324-13325.
370. Marlon K. Thompson, Mauro Botta, Galle Nicolle, Lothar Helm, Silvio Aime, André E. Merbach and Kenneth N. Raymond. “A Highly Stable Gadolinium Complex with a Fast, Associative Mechanism of Water Exchange.” *J. Am. Chem. Soc.* **2003**, *125*, 14274-14275.
371. Robert M. Yeh, Anna V. Davis and Kenneth N. Raymond. “Supramolecular Systems: Self-assembly” in *Comprehensive Coordination Chemistry II*, Vol. 7: Fujita, M.; Powell, A.; Creutz, A., Eds.: Elsevier, Ltd., 2003; pp. 327-355. [Review](#)
372. Emily A. Dertz and Kenneth N. Raymond. “Siderophores and Transferrins” in *Comprehensive Coordination Chemistry II*, Vol. 8; Que, L., Jr.; Tolman, W. B., Eds.: Elsevier, Ltd., 2003; pp. 141-168. [Review](#)
373. Anne E. V. Gorden, Jide Xu, Kenneth N. Raymond and Patricia Durbin. “Rational Design of Sequestering Agents for Plutonium and Other Actinides.” *Chem. Rev.* **2003**, *103*, 4207-4282. [Review](#)
374. Dorothea Fiedler, Daniela Pagliero, Julia L. Brumaghim, Robert G. Bergman and Kenneth N. Raymond. “Encapsulation of Cationic Ruthenium Complexes into a Chiral Self-Assembled Cage.” *Inorg. Chem.* **2004**, *43*, 846-848.
375. Dennis H. Leung, Dorothea Fiedler, Robert G. Bergman and Kenneth N. Raymond. “Selective C-H Bond Activation by a Supramolecular Host-Guest Assembly.” *Angew. Chem. Int. Ed.* **2004**, *43*, 963-966.
376. Dorothea Fiedler, Dennis H. Leung, Robert G. Bergman, and Kenneth N. Raymond. “Enantioselective Guest Binding and Dynamic Resolution of Cationic Ruthenium

- Complexes by a Chiral Metal-Ligand Assembly.” *J. Am. Chem. Soc.* **2004**, *126*, 3674-3675.
377. Jide Xu, David G. Churchill, Mauro Botta and Kenneth N. Raymond. “Gadolinium(III) 1,2-Hydroxypyridonate-Based Complexes: Toward MRI Contrast Agents of High Relaxivity.” *Inorg. Chem.* **2004**, *43*, 5492-5494.
378. Christine J. Gramer and Kenneth N. Raymond, “Characterization of 2,3-Dihydroxyterephthalamides as M(IV) Chelators.” *Inorg. Chem.* **2004**, *43*, 6397-6402.
379. Christine J. Gramer, Kenneth N. Raymond, Gordon Jarvinen, Thomas Robison, Norman Schroeder, Barbara Smith, “The Removal of Pu(IV) from Aqueous Solution Using 2,3-Dihydroxyterephthalamide-Functionalized PEI with Polymer Filtration.” *Sep. Sci. Technol.* **2004**, *39*, 321-339.
380. Jide Xu, Anne E. V. Gorden, and Kenneth N. Raymond , “Octadentate Ligands Containing 2,3-Dihydroxybenzamide and 2,3-Dihydroxyterephthalamide Coordinating Subunits on a Tetrapodal Amine Backbone for Chelation of Actinides.” *Eur. J. Org. Chem.* **2004**, *15*, 3244-3253.
381. Alan C. Veeck, David J. White, Donald W. Whisenhunt, Jr., Jide Xu, Anne E. V. Gorden, Vadim Romanovski, Darleane C. Hoffman, and Kenneth N. Raymond, “Hydroxypyridinone Extraction Agents for Pu(IV).” *Solv. Extract. Ion Exch.* **2004**, *22*, 1037–1068.
382. Emily A. Dertz and Kenneth N. Raymond, “Biochemical and Physical Properties of Siderophores” chapter in *Iron Transport in Bacteria*; Eds. Shelly Payne and Jorge Crosa, ASM Press, 2004; pp. 5-17. [Review](#)
383. David H. Hamilton, Isabelle Turcot, Alain Stintzi and Kenneth N. Raymond. “Large Cooperativity in the Removal of Iron from Transferrin at Physiological Temperature and Chloride Ion Concentration.” *J. Biol. Inorg. Chem.* **2004**, *9*, 1432-1327.
384. Julia L. Brumaghim, Martin Michels, and Kenneth N. Raymond, “Hydrophobic Chemistry in Aqueous Solution: Stabilization and Stereoselective Encapsulation of Phosphonium Guests in a Supramolecular Host.” *Eur. J. Org. Chem.* **2004**, *22*, 4552 - 4559.
385. Julia L. Brumaghim, Martin Michels, and Kenneth N. Raymond, “Encapsulation and Stabilization of Reactive Aromatic Diazonium Ions and the Tropylium Ion within a Supramolecular Host.” *Eur. J. Org. Chem.* **2004**, *24*, 5115-5118.
386. Dorothea Fiedler, Robert G. Bergman, and Kenneth N. Raymond, “Supramolecular Catalysis of a Unimolecular Transformation: Aza-Cope Rearrangement within a Self-Assembled Host.” *Angew. Chem. Int. Ed.* **2004**, *43*, 6748 – 6751. [Cover article. Subject of an Angewandte Highlight: A. Lützen, Angew. Chem. Int. Ed. 2005, 44, 1000 – 1002.](#)
387. Mary Katherine Johansson, Ronald M. Cook, Jide Xu, and Kenneth N. Raymond “Time Gating Improves Sensitivity in Energy Transfer Assays with Terbium Chelate/Dark Quencher Oligonucleotide Probes.” *J. Am. Chem. Soc.* **2004**, *126*, 16451 – 16455.

388. Benjamin P. Hay, Eric J. Werner, and Kenneth N. Raymond, "Estimating the Number of Bound Waters in Gd(III) Complexes Revisited. Improved Methods for the Prediction of q-Values." *Bioconj. Chem.* **2004**, *15*, 1496 – 1502.
389. Valérie C. Pierre, Marco Melchior, Dan M. J. Doble and Kenneth N. Raymond. "Toward Optimized High-Relaxivity MRI Agents: Thermodynamic Selectivity of Hydroxypyridonate/Catecholate Ligands." *Inorg. Chem.* **2004**, *43*, 8520-8525.
390. Marlon K. Thompson, Dan M. J. Doble, Luke Tso, Serena Barra, Mauro Botta, Silvio Aime and Kenneth N. Raymond. "Hetero-Tripodal Hydroxypyridonate Gadolinium Complexes: Syntheses, Relaxometric Properties, Water Exchange Dynamics and Human Serum Albumin Binding." *Inorg. Chem.* **2004**, *43*, 8577-8586.
391. Michael D. Pluth, Robert G. Bergman, and Kenneth N. Raymond, "Encapsulation of Cationic Organometallic Guests by a Chiral Self-Assembled Supramolecular Cage: Enantioselective Binding, Dynamic Resolution, and Selective C-H Bond Activation." *ChemTracts - Inorg.* , **2004**, *17*, 515-522. [Review. Special issue dedicated to Fred Basolo.](#)
392. Kenneth N. Raymond and Valérie C. Pierre. "Next Generation, High Relaxivity Gadolinium MRI Agents." *Bioconjugate Chem.* **2005**, *16*, 3-8. [Review](#)
393. Valérie C. Pierre, Mauro Botta and Kenneth N. Raymond. "Dendrimeric Gadolinium Chelate with Fast Water Exchange and High Relaxivity at High Magnetic Field Strength." *J. Am. Chem. Soc.* **2005**, *127*, 504-505.
394. Kristy M. Clarke Jurchen and Kenneth N. Raymond, "Linear Hexadentate Ligands as Iron Chelators." *J. Coord. Chem.* **2005**, *58*, 55-80.
395. Wassana Yantasee, Glen E. Fryxell, Yuehe Lin, Hong Wu, Kenneth N. Raymond and Jide Xu, "Hydroxypyridinone (HOPO) Functionalized Self-Assembled Monolayers on Nanoporous Silica for Sequestering Lanthanide Cations." *J. Nanosci. Nanotech.* **2005**, *5*, 527-535.
396. Yuehe Lin, Sandra K Fiskum, Wassana Yantasee, Hong Wu, Shas V. Mattigod, Glen E. Fryxell, Kenneth N. Raymond and Jide Xu, "Incorporation of Hydroxypyridinone Ligands into Self-Assembled Monolayers on Mesoporous Supports for Selective Actinide Sequestration." *Environ. Sci. Technol.*, **2005**, *39*, 1332-1337.
397. Anne E. V. Gorden, David K. Shuh, Bryan E. F. Tiedemann, Richard E. Wilson, Jide Xu, Kenneth N. Raymond, "Sequestered Plutonium: [Pu<sup>(IV)</sup>{5LIO(Me-3,2-HOPO)}<sub>2</sub>]- The First Structurally Characterized Plutonium Hydroxypyridonate Complex." *Chem. Eur. J.* **2005**, *11*, 2842-2848. [Cover article. Corrigendum published in \*Chem. Eur. J.\* \*\*2007\*\*, \*13\*, 368 – 378.](#)
398. Dorothea Fiedler, Dennis H. Leung, Robert G. Bergman, Kenneth N. Raymond, "Selective Molecular Recognition, C-H Bond Activation and Catalysis in Nanoscale Reaction Vessels." *Acc. Chem. Res.*, **2005**, *38*, 351-360. [Special issue devoted to "Molecular Architectures."](#)

399. Marlon K. Thompson, Bernd Misselwitz, Luke Tso, Dan M. J. Doble, Heribert Schmitt-Willich and Kenneth N. Raymond, "In Vivo Evaluation of Gadolinium Hydroxypyridonate Chelates: Initial Experience as Contrast Media in Magnetic Resonance Imaging," *J. Med. Chem.*, **2005**, *48*, 3874-3877.
400. Anna V. Davis and Kenneth N. Raymond, "The Big Squeeze: Guest Exchange in an  $M_4L_6$  Supramolecular Host." *J. Am. Chem. Soc.*, **2005**, *127*, 7912-7919.
401. Robert M. Yeh, Jide Xu, Georg Seeber and Kenneth N. Raymond, "Large  $M_4L_4$  ( $M = Al(III), Ga(III), In(III), Ti(IV)$ ) Tetrahedral Coordination Cages: an Extension of Symmetry-Based Design." *Inorg. Chem.* **2005**; *44*, 6228-6239.
402. Bryan E. F. Tiedemann and Kenneth N. Raymond, "Dangling Arms: A Tetrahedral Supramolecular Host with Partially Encapsulated Guests." *Angew. Chem. Int. Ed.*, **2006**, *45*, 83–86.
403. Dorothea Fiedler, Robert G. Bergman and Kenneth N. Raymond, "Stabilization of Reactive Organometallic Intermediates inside a Self-Assembled Nanoscale Host." *Angew. Chem. Int. Ed.*, **2006**, *45*, 745-748.
404. Emily A. Dertz, Jide Xu, Alain Stintzi, and Kenneth N. Raymond, "Bacillibactin-Mediated Iron Transport in *Bacillus subtilis*." *J. Am. Chem. Soc.*, **2006**, *128*, 22-23.
405. Robert M. Yeh and Kenneth N. Raymond, "Supramolecular Asymmetric Induction in Dinuclear Triple-Stranded Helicates." *Inorg. Chem.*, **2006**, *45*, 1130-1139.
406. Anna V. Davis, Dorothea Fiedler, Georg Seeber, Achim Zahl, Rudi van Eldik, and Kenneth N. Raymond, "Guest Exchange Dynamics in an  $M_4L_6$  Tetrahedral Host." *J. Am. Chem. Soc.*, **2006**, *128*, 1324-1333.
407. Kristy M. Clarke Jurchen and Kenneth N. Raymond, "Terephthalamide-Containing Analogs of TREN-Me-3,2-HOPO." *Inorg. Chem.*, **2006**, *45*, 1078-1090.
408. Georg Seeber, Bryan Tiedemann and Kenneth N. Raymond, "Supramolecular Chirality in Coordination Chemistry," chapter in *Top. Curr. Chem.*, Vol 265, M. Crego-Calama and D.N. Reinhoudt, Eds., Springer-Verlag, Berlin, Heidelberg, **2006**, 147-183. [Review](#)
409. David T. Puerta, Mauro Botta, Christoph J. Jocher, Eric J. Werner, Stefano Avedano, Kenneth N. Raymond, and Seth M. Cohen, "Tris(pyronate) Chelates of Gd(III) as High Solubility MRI-CA," *J. Am. Chem. Soc.*, **2006**, *128*, 2222-2223.
410. Kristy M. Clarke Jurchen and Kenneth N. Raymond, "A Bidentate Terephthalamide Ligand TAMmeg, as an Entry into Terephthalamide-containing Therapeutic Iron Chelating Agents," *Inorg. Chem.* **2006**, *45*, 2438-2447.
411. Valérie C. Pierre, Mauro Botta, Silvio Aime and Kenneth N. Raymond, "Tuning the Coordination Number of Hydroxypyridonate-based Gadolinium Complexes – Implications for MRI Contrast Agents," *J. Am. Chem. Soc.* **2006**, *128*, 5344-5345.

412. Ulla N. Andersen, Georg Seeber, Dorothea Fiedler, Dayin Lin Don Harris and Kenneth N. Raymond, "Characterization of Self-assembled Supramolecular [Ga<sub>4</sub>L<sub>6</sub>] Host-guest Complexes by Electrospray Ionization Mass Spectrometry," *J. Am. Soc. Mass Spectrom.* **2006**, *17*, 292-296.
413. Rebecca J. Abergel and Kenneth N. Raymond, "Synthesis and Thermodynamic Evaluation of Mixed Hexadentate Linear Iron Chelators Containing Hydroxypyridinone and Terephthalamide Units," *Inorg. Chem.* **2006**, *45*, 3622-3631.
414. Emily A. Dertz, Jide Xu and Kenneth N. Raymond, "Tren Based Analogs of Bacillibactin: Structure and Stability," *Inorg. Chem.* **2006**, *45*, 5465-5478.
415. Anna V. Davis, Timothy K. Firman, Benjamin P. Hay and Kenneth N. Raymond, "d-Orbital Effects on Stereochemical Non-Rigidity: Twisted Ti<sup>IV</sup> Intramolecular Dynamics," *J. Am. Chem. Soc.* **2006**, *128*, 9484-9496.
416. Valérie C. Pierre, Mauro Botta, Silvio Aime, Kenneth N. Raymond, "Fe(III) Templated Gd(III) Self-Assemblies – a New Route Toward Macromolecular MRI Contrast Agents," *J. Am. Chem. Soc.* **2006**, *128*, 9272-9273.
417. Rebecca J. Abergel, Jeffrey A. Warner, David K. Shuh, and Kenneth N. Raymond, "Enterobactin Protonation and Iron Release: Structural Characterization of the Salicylate Coordination Shift in Ferric Enterobactin," *J. Am. Chem. Soc.* **2006**, *128*, 8920-8931.
418. Dennis H. Leung, Robert G. Bergman, Kenneth N. Raymond, "Scope and Mechanism of the C-H Bond Activation Reactivity within a Supramolecular Host by an Iridium Guest: A Stepwise Ion Pair Guest Dissociation Mechanism," *J. Am. Chem. Soc.* **2006** *128*, 9781-9797.
419. Dorothea Fiedler, Herman van Halbeek, Robert G. Bergman and Kenneth N. Raymond, "Supramolecular Catalysis of Unimolecular Rearrangements: Substrate Scope and Mechanistic Insights," *J. Am. Chem. Soc.* **2006** *128*, 10240-10252. [Subject of an Editor's Choice commentary in \*Science\* \(2006, 313, 735\).](#)
420. Melissa K. Wilson, Rebecca J. Abergel, Kenneth N. Raymond, Jean E. L. Arceneaux and Benjamin R Byers, "Siderophores of *Bacillus anthracis*, *Bacillus cereus*, and *Bacillus thuringiensis*," *Biochem. Biophys. Res. Commun.* **2006** *348*, 320-325. [Kathleen M. Wong, "Ironing Out Bacterial Infections," \*Science Matters@ Berkeley\* 2006, 23](#)
421. Evan G. Moore, Jide Xu, Christoph J. Jocher, Eric J. Werner, and Kenneth N. Raymond, "Cymothoe Sangaris': An Extremely Stable and Highly Luminescent 1,2-Hydroxypyridinonate Chelate of Eu(III)," *J. Am. Chem. Soc.* **2006** *128*, 10648-10649.
422. Rebecca J. Abergel, Evan G. Moore, Roland K. Strong, and Kenneth N. Raymond, "Microbial Evasion of the Immune System: Structural Modifications of Enterobactin Impair Siderocalin Recognition," *J. Am. Chem. Soc.* **2006**, *128*, 10998-10999.

423. Valérie C. Pierre, Mauro Botta, Silvio Aime, and Kenneth N. Raymond, "Substituent Effects on Gd(III)-Based MRI Contrast Agents: Optimizing the Stability and Selectivity of the Complex and the Number of Coordinated Water Molecules," *Inorg. Chem.* **2006**, *45*, 8355-8364.
424. Jide Xu and Kenneth N. Raymond, "Structurally Characterized Quadruple Stranded Bis-Bidentate Helicates," *Angew. Chem. Int. Ed.* **2006**, *45*, 6480-6485.
425. Michael A. Fischbach, Hening Lin, Lu Zhou, Yang Yu, Rebecca J. Abergel, David R. Liu, Kenneth N. Raymond, Barry L. Wanner, Roland K. Strong, Christopher T. Walsh, Alan Aderem, and Kelly D. Smith, "The Pathogen-associated *IroA* Gene Cluster Mediates Bacterial Evasion of Lipocalin 2," *Proc. Nat. Acad. Sci. USA* **2006**, *103*, 16502-16507.
426. Vy M. Dong, Dorothea Fiedler, Barbara Carl, Robert G. Bergman, and Kenneth N. Raymond, "Molecular Recognition and Stabilization of Iminium Ions in Water," *J. Am. Chem. Soc.* **2006**, *128*, 14464-14465. [Subject of a Nature commentary \(2006, 444, 557\)](#).
427. Emily A. Dertz, Alain Stintzi, and Kenneth N. Raymond, "Siderophore-mediated Iron Transport in *B. subtilis* and *C. glutamicum*," *J. Biol. Inorg. Chem.* **2006** *11*, 1087-1097.
428. Rebecca J. Abergel, Melissa K. Wilson, Jean E. L. Arceneaux, Trisha M. Hoette, Roland K. Strong, B. Rowe Byers, and Kenneth N. Raymond, "The Anthrax Pathogen Evades the Mammalian Immune System Through Stealth Siderophore Production," *Proc. Natl. Acad. Sci. USA* **2006**, *103*, 18499-18503. [Subject of a Nature research highlights \(2006, 444, 793\)](#) and several press reports.
429. Michael D. Pluth and Kenneth N. Raymond, "Reversible Guest Exchange Mechanisms in Supramolecular Host-Guest Assemblies," *Chem. Soc. Rev.* **2007**, *36*, 161-171. [Review. Selected by journal for enriched html, see: <http://xlink.rsc.org/?doi=b603168b>. Recognized as within the top 20 articles, published in 2007, contributing to the 2008 ChemSocRev Impact Factor.](#)
430. Stéphane Petoud, Gilles Muller, Evan G. Moore, Jide Xu, Jurek Sokolnicki, James P. Riehl, Uyen Le, Seth M. Cohen, Kenneth N. Raymond, "Brilliant Sm, Eu, Tb and Dy Chiral Lanthanide Complexes with Strong Circularly Polarized Luminescence," *J. Am. Chem. Soc.* **2007**, *129*, 77-83.
431. Michael Seitz, Michael D. Pluth, and Kenneth N. Raymond, "1,2-HOIQO – A Highly Versatile 1,2-HOPO Analog," *Inorg. Chem.* **2007**; *46*; 351-353.
432. Eric J. Werner, Stefano Avedano, Mauro Botta, Benjamin P. Hay, Evan G. Moore, Silvio Aime, and Kenneth N. Raymond, "Highly Soluble Tris-Hydroxypyridonate Gd(III) Complexes with Increased Hydration Number, Fast Water Exchange, Slow Electronic Relaxation, and High Relaxivity," *J. Am. Chem. Soc.* **2007**, *129*, 1870-1871.

433. Dennis H. Leung, Robert G. Bergman, and Kenneth N. Raymond, "Highly Selective Supramolecular Catalyzed Allylic Alcohol Isomerization," *J. Am. Chem. Soc.* **2007**, *129*, 2746-2747.
434. Michael D. Pluth, Robert G. Bergman, and Kenneth N. Raymond, "Acid Catalysis in Basic Solution: A Supramolecular Host Promotes Orthoformate Hydrolysis," *Science* **2007**, *316*, 85-88. [Subject of Chemical & Engineering News concentrate 2007](#), *85(15)*, 36.
435. Anne E. V. Gorden, Jide Xu, Géza Szigethy, Allen Oliver, David K. Shuh and Kenneth N. Raymond, "Characterization of a Mixed Salt of 1-Hydroxy-pyridin-2-one Pu(IV) Complexes," *J. Am. Chem. Soc.* **2007**, *129*, 6674-6675.
436. Christoph J. Jocher, Mauro Botta, Stefano Avedano, Evan G. Moore, Jide Xu, and Kenneth N. Raymond, "Optimized Relaxivity and Stability of [Gd(H(2,2)-1,2-HOPO)(H<sub>2</sub>O)]<sup>-</sup> for Use as MRI Contrast Agent," *Inorg. Chem.* **2007**, *46*, 4796-4798.
437. Bryan E.F. Tiedemann and Kenneth N. Raymond, "Second-Order Jahn-Teller Effect in a Host-Guest Complex," *Angew. Chem. Int. Ed.* **2007**, *46*, 4976-4978.
438. Evan G. Moore, Christoph J. Jocher, Jide Xu, Eric J. Werner and Kenneth N. Raymond, "An Octadentate Luminescent Eu(III) 1,2-HOPO Chelate with Potent Aqueous Stability," *Inorg. Chem.* **2007**, *46*, 5468-5470.
439. Jacob M. Hooker, Ankona Datta, Mauro Botta, Kenneth N. Raymond, and Matthew B. Francis, "Magnetic Resonance Contrast Agents from Viral Capsid Shells: A Comparison of Exterior and Interior Cargo Strategies," *Nano Lett.* **2007**, *7*, 2207-2210.
440. Michael D. Pluth, Robert G. Bergman and Kenneth N. Raymond, "Making Amines Strong Bases: Thermodynamic Stabilization of Protonated Guests in a Highly-Charged Supramolecular Host," *J. Am. Chem. Soc.* **2007**, *129*, 11459-11467.
441. Michael Seitz, Allen G. Oliver and Kenneth N. Raymond, "The Lanthanide Contraction Revisited," *J. Am. Chem. Soc.* **2007**, *129*, 11153-11160.
442. Shannon M. Biros, Robert G. Bergman, and Kenneth N. Raymond, "The Hydrophobic Effect Drives the Recognition of Hydrocarbons by an Anionic Metal-Ligand Cluster," *J. Am. Chem. Soc.* **2007**, *129*, 12094-12095.
443. Michael D. Pluth, Robert G. Bergman, and Kenneth N. Raymond, "Catalytic Deprotection of Acetals in Basic Solution with a Self-Assembled 'Nanozyme'," *Angew. Chem. Int. Ed.* **2007**, *46*, 8587-8589.
444. Christoph J. Jocher, Evan G. Moore, Jide Xu, Stefano Avedano, Mauro Botta, Silvio Aime, and Kenneth N. Raymond, "1,2-Hydroxypyridonates as Contrast Agents for Magnetic Resonance Imaging: TREN-1,2-HOPO," *Inorg. Chem.* **2007**, *46*, 9182-9191.

445. Michael Seitz, Evan G. Moore, Andrew J. Ingram, Gilles Muller, and Kenneth N. Raymond, "Enantiopure, Octadentate Ligands as Sensitizers for Europium and Terbium Circularly Polarized Luminescence in an Aqueous Solution," *J. Am. Chem. Soc.* **2007**, *129*, 15468-15470.
446. Anna V. Davis, Dorothea Fiedler, Marco Ziegler, Andreas Terpin, and Kenneth N. Raymond, "Resolution of Chiral, Tetrahedral  $M_4L_6$  Metal-Ligand Hosts," *J. Am. Chem. Soc.* **2007**, *129*, 15354-15363.
447. Rebecca J. Abergel and Kenneth N. Raymond, "Terephthalamide-Containing Ligands: A New Class of Fast Iron Chelators" *J. Biol. Inorg. Chem.* **2008**, *13*, 229-240.
448. Ankona Datta, Jacob M. Hooker, Mauro Botta, Matthew B. Francis, Silvio Aime, and Kenneth N. Raymond, "High Relaxivity Gadolinium Hydroxypyridonate-Viral Capsid Conjugates: Nano-sized MRI Contrast Agents," *J. Am. Chem. Soc.* **2008**, *130*, 2546-2552. [Subject of a contribution in \*Biophotonics International\* \*\*2008\*\*, \*15\*, 42-45.](#)
449. Rebecca J. Abergel, Anna M. Zawadzka and Kenneth N. Raymond, "Petrobactin-Mediated Iron Transport in Pathogenic Bacteria: Coordination Chemistry of an Unusual 3,4-Catecholate/Citrate Siderophore," *J. Am. Chem. Soc.* **2008**, *130*, 2124-2125.
450. Dennis H. Leung, Robert G. Bergman and Kenneth N. Raymond, "Enthalpy-Entropy Compensation Reveals Solvent Reorganization as a Driving Force for Supramolecular Encapsulation in Water," *J. Am. Chem. Soc.* **2008**, *130*, 2798-2805.
451. Michael D. Pluth, Bryan E. F. Tiedemann, Herman van Halbeek, Rudi Nunlist and Kenneth N. Raymond, "Diffusion of a Highly Charged Supramolecular Assembly: Direct Observation of Ion Association in Water," *Inorg. Chem.* **2008**, *47*, 1411-1413.
452. Michael D. Pluth, Robert G. Bergman, Kenneth N. Raymond, "Selective Stoichiometric and Catalytic Reactivity in the Confines of a Chiral Supramolecular Assembly," chapter in *Supramolecular Catalysis*; Ed. Piet W. N. M. van Leeuwen, Wiley-VCH, 2008; pp. 165-191.
453. Gēza Szigethy, Jide Xu, Anne E.V. Gorden, Simon J. Teat, David K. Shuh, and Kenneth N. Raymond, "Surprising Coordination Geometry Differences in Ce(IV)- and Pu(IV)-Maltol Complexes," *Eur. J. Inorg. Chem.* **2008**, 2143-2147.
454. Evan G. Moore, Jide Xu, Christoph J. Jocher, Ingrid Castro Rodriguez and Kenneth N. Raymond, "Highly Luminescent Lanthanide Complexes of 1-Hydroxy-2-pyridinones," *Inorg. Chem.* **2008**, *47*, 3105-3118.
455. Michael D. Pluth, Robert G. Bergman and Kenneth N. Raymond, "Selective Organic and Organometallic Reactions in Water-Soluble Host-Guest Supramolecular Systems," *The Nucleus* **2008**, *8*, 10-17, 20-21. [Publication of the Northeastern Section of the American Chemical Society, Inc](#)



456. Michael D. Pluth, Robert G. Bergman and Kenneth N. Raymond, "Encapsulation of Protonated Diamines in a Water-Soluble, Chiral, Supramolecular Assembly Allows for Measurement of Hydrogen-Bond Breaking Followed by Nitrogen Inversion/Rotation," *J. Am. Chem. Soc.* **2008**, *130*, 6362-6366.
457. Michael Seitz and Kenneth N. Raymond, "Efficient Route to Highly Water-Soluble Cyclic Hydroxamic Acid Ligands," *Eur. J. Org. Chem.* **2008**, *16*, 2697-2700.
458. Anthony D'Aléo, Jide Xu, Evan G. Moore, Christoph J. Jocher and Kenneth N. Raymond, "Aryl-Bridged 1-Hydroxypyridin-2-one: Sensitizer Ligands for Eu(III)," *Inorg. Chem.* **2008**, *47*, 6109-6111.
459. Shannon M. Biros, Robert M. Yeh, and Kenneth N. Raymond, "Design and Formation of a Large, Tetrahedral Cluster Using 1,1'-Binaphthyl Ligands," *Angew. Chem. Int. Ed.* **2008**, *47*, 6062-6064.
460. Amanda P. S. Samuel, Evan G. Moore, Marco Melchior, Jide Xu and Kenneth N. Raymond, "Water-Soluble 2-Hydroxyisophthalamides for Sensitization of Lanthanide Luminescence," *Inorg. Chem.* **2008**, *47*, 7535-7544.
461. Courtney J. Hastings, Michael D. Pluth, Shannon M. Biros, Robert G. Bergman and Kenneth N. Raymond, "Simultaneously Bound Guests and Chiral Recognition: A Chiral Self-Assembled Supramolecular Host Encapsulates Hydrophobic Guests," *Tetrahedron* **2008**, *64*, 8362-8367.
462. Courtney J. Hastings, Dorothea Fiedler, Robert G. Bergman, Kenneth N. Raymond, "Aza Cope Rearrangement of Propargyl Enammonium Cations Catalyzed By a Self-Assembled 'Nanozyme'," *J. Am. Chem. Soc.* **2008**, *130*, 10977-10983.
463. Michael D. Pluth, Robert G. Bergman, and Kenneth N. Raymond, "Supramolecular Catalysis of Orthoformate Hydrolysis in Basic Solution: An Enzyme-Like Mechanism," *J. Am. Chem. Soc.* **2008**, *130*, 11423-11429.
464. Michael D. Pluth, Robert G. Bergman, and Kenneth N. Raymond, "Acceleration of Amide Bond Rotation by Encapsulation in the Hydrophobic Interior of a Water-Soluble Supramolecular Assembly," *J. Org. Chem.* **2008**, *73*, 7132-7136.
465. Rebecca J. Abergel, Matthew C. Clifton, Juan C. Pizarro, Jeffrey A. Warner, David K. Shuh, Roland K. Strong and Kenneth N. Raymond, "The Siderocalin/Enterobactin Interaction: A Link between Mammalian Immunity and Bacterial Iron Transport," *J. Am. Chem. Soc.* **2008**, *130*, 11524-11534.
466. Christoph J. Jocher, Evan G. Moore, Jason D. Pierce, and Kenneth N. Raymond, "Aqueous Ln(III) Luminescence Agents Derived from a Tasty Precursor," *Inorg. Chem.* **2008**, *47*, 7951-7953.

467. Evan G. Moore, Michael Seitz, and Kenneth N. Raymond, "Use of Yb(III) Centered Near Infra-Red (NIR) Luminescence to Determine the Hydration State of a 3,2-HOPO based MRI-Contrast Agent," *Inorg. Chem.* **2008**, *47*, 8571-8573.
468. Géza Szigethy, Kenneth N. Raymond, "On the Suitability of Lanthanides as Actinide Analogs," *Mater. Res. Soc. Proc.* **2008**, *1104*, NN04-01.
469. Michael Seitz, Evan G. Moore, and Kenneth N. Raymond, "Highly Fluorescent Group 13 Metal Complexes with Cyclic, Aromatic Hydroxamic Acid Ligands," *Inorg. Chem.* **2008**, *47*, 8665-8673.
470. Eric J. Werner, Ankona Datta, Christoph J. Jocher, and Kenneth N. Raymond, "High-Relaxivity MRI Contrast Agents: Where Coordination Chemistry Meets Medical Imaging," *Angew. Chemie. Intl. Ed.* **2008**, *47*, 8568-8580. [Invited mini-review published in English and German.](#)
471. Evan G. Moore, Géza Szigethy, Jide Xu, Lars-Olof Palsson, Andrew Beeby and Kenneth N. Raymond, "3-Hydroxypyridin-2-one Complexes of Near-Infrared (NIR) Emitting Lanthanides: Sensitization of Holmium(III) and Praseodymium(III) in Aqueous Solution," *Angew. Chem. Intl. Ed.* **2008**, *47*, 9500–9503.
472. Trisha M. Hoette, Rebecca J. Abergel, Jide Xu, Roland K. Strong, and Kenneth N. Raymond, "The Role of Electrostatics in Siderophore Recognition by the Immunoprotein Siderocalin," *J. Am. Chem. Soc.* **2008**, *130*, 17584–17592.
473. Michael D. Pluth, Darren W. Johnson, Géza Szigethy, Anna V. Davis, Simon J. Teat, Allen G. Oliver, Robert G. Bergman, and Kenneth N. Raymond, "Structural Consequences of Anionic Host- Cationic Guest Interactions in a Supramolecular Assembly," *Inorg. Chem.* **2009**, *48*, 111-120.
474. Eric J. Werner, Julia Kozhukh, Mauro Botta, Evan G. Moore, Stefano Avedano, Silvio Aime and Kenneth N. Raymond, "1,2-Hydroxypyridonate/Terephthalamide Complexes of Gadolinium(III): Synthesis, Stability, Relaxivity, and Water Exchange Properties," *Inorg. Chem.* **2009**, *48*, 277-286.
475. Michael D. Pluth, Robert G. Bergman and Kenneth N. Raymond, "The Acid Hydrolysis Mechanism of Acetals Catalyzed by a Supramolecular Assembly in Basic Solution," *J. Org. Chem.* **2009**, *74*, 58-63.
476. Amanda P. S. Samuel, Jide Xu, and Kenneth N. Raymond, "Predicting Efficient Antenna Ligands for Tb(III) Emission," *Inorg. Chem.* **2009**, *48*, 687–698.
477. Michael D. Pluth, Dorothea Fiedler, Jeffrey S. Mugridge, Robert G. Bergman, Kenneth N. Raymond, "Encapsulation and Characterization of Proton-Bound Amine Homodimers in a Water-Soluble, Self-Assembled Supramolecular Host," *Proc. Natl. Acad. Sci. U.S.A.* **2009**, *106*, 10438-10443.

478. Evan G. Moore, Amanda P. S. Samuel and Kenneth N. Raymond, "From Antenna to Assay: Lessons Learned in Lanthanide Luminescence," *Acc. Chem. Res.* **2009**, *42*, 542-552. [Invited paper.](#)
479. Anna M. Zawadzka, Rebecca J. Abergel, Rita Nichiporuk, Ulla N. Andersen and Kenneth N. Raymond, "Siderophore-mediated iron acquisition systems in *Bacillus cereus*: identification of receptors for anthrax virulence-associated petrobactin," *Biochemistry* **2009**, *48*, 3645-3657.
480. Ankona Datta and Kenneth N. Raymond, "Gd-Hydroxypyridinone (HOPO)-Based High-Relaxivity Magnetic Resonance Imaging (MRI) Contrast Agents," *Accts. Chem. Res.* **2009**, *42*, 938-947. [Invited paper for special issue dedicated the topic of "Molecular Imaging."](#)
481. Michael D. Pluth, Robert G. Bergman, and Kenneth N. Raymond, "Proton Mediated Chemistry and Catalysis in a Self-Assembled Supramolecular Host," *Accts. Chem. Res.* **2009**, *42*, 1650-1659. [Review](#)
482. Michael Seitz, King Do, Andrew J. Ingram, Evan G. Moore, Gilles Muller, and Kenneth N. Raymond, "Circularly Polarized Luminescence in Enantiopure Europium and Terbium Complexes with Modular, All-Oxygen Donor Ligands," *Inorg. Chem.* **2009**, *48*, 8469-8479.
483. Kenneth N. Raymond, "Supramolecular chemistry: Phosphorus caged," *Nature* **2009**, *460*, 585-586.
484. Rebecca J. Abergel, Anna M. Zawadzka, Trisha M. Hoette and Kenneth N. Raymond, "Enzymatic Hydrolysis of Trilactone Siderophores: Where Chiral Recognition Occurs in Enterobactin and Bacillibactin Iron Transport," *J. Am Chem. Soc.* **2009**, *131*, 12682-12692.
485. Anthony D'Aleo, Evan G. Moore, Géza Szigethy, Jide Xu and Kenneth N. Raymond, "Aryl Bridged 1-Hydroxypyridin-2-one: Effect of the Bridge on the Eu(III) Sensitization Process," *Inorg. Chem.* **2009**, *48*, 9316-9324.
486. Evan G. Moore, Anthony D'Aléo, Jide Xu, and Kenneth N. Raymond, "Eu<sup>III</sup> Complexes of Octadentate 1-Hydroxy-2-pyridinones: Stability and Improved Photophysical Performance," *Aust. J. Chem.* **2009**, *62*, 1300-1307. [Invited paper for the Alan Sargeson Commemorative Issue.](#)
487. Eric J. Werner, Mauro Botta, Silvio Aime, and Kenneth N. Raymond, "Effect of a Mesitylene-Based Ligand Cap on the Relaxometric Properties of Gd(III) Hydroxypyridonate MRI Contrast Agents," *Contrast Media Mol. Imaging* **2009**, *4*, 220-229.
488. Rebecca J. Abergel, Anthony D'Aleo, Clara Ng Pak Leung, David K. Shuh and Kenneth N. Raymond, "Using the Antenna Effect as a Spectroscopic Tool: Photophysics and Solution Thermodynamics of the Model Luminescent Hydroxypyridonate Complex [Eu<sup>III</sup>(3,4,3-LI(1,2-HOPO))] <sup>-</sup>," *Inorg. Chem.* **2009**, *48*, 10868-10870.

489. Casey J. Brown, Robert G. Bergman, and Kenneth N. Raymond, “Enantioselective Catalysis of the Aza-Cope Rearrangement by a Chiral Supramolecular Assembly,” *J. Am. Chem. Soc.* **2009**, *131*, 17530–17531.
490. Anthony D'Aléo, Jide Xu, King Do, Gilles Muller and Kenneth N. Raymond, “A [Cyclentetrakis(methylene)]tetrakis[2-hydroxybenzamide] Ligand That Complexes and Sensitizes Lanthanide(III) Ions,” *Helv. Chim. Acta.* **2009**, *92*, 2439-2460. [Invited paper Dedicated to Professor Jean-Claude Bünzli on the occasion of his 65th birthday.](#)
491. Géza Szigethy and Kenneth N. Raymond, “Designing the Ideal Uranyl Ligand: a Sterically Induced Speciation Change in Complexes with Thiophene-Bridged Bis(3-hydroxy-N-methylpyridin-2-one),” *Inorg. Chem.* **2009**, *48*, 11489–11491.
492. Anna M. Zawadzka, Youngchang Kim, Natalia Maltseva, Rita Nichiporuk, Yao Fan, Andrzej Joachimiak, and Kenneth N. Raymond, “Characterization of a *Bacillus subtilis* transporter for petrobactin, an anthrax stealth siderophore,” *Proc. Nat. Acad. Sci. USA* **2009**, *106*, 21854-21859.
493. Wassana Yantasee, Glen E. Fryxell, R. Shane Addleman, Robert J. Wiacek, View Koonsiripaiboon, Kanda Pattamakomsan, Vichaya Sukwarotwat, Jide Xu and Kenneth N. Raymond, “Selective removal of lanthanides from natural waters, acidic streams and dialysate,” *J. Hazard. Mater.* **2009**, *168*, 1233-1238.
494. Melissa K. Wilson, Rebecca J. Abergel, Jean E. L. Arceneaux, Kenneth N. Raymond and B. Rowe Byers, “Temporal Production of the Two *Bacillus anthracis* Siderophores, Petrobactin and Bacillibactin,” *Biometals* **2010**, *23*, 129–134.
495. Carmelo Sgarlata, Jeffrey S. Mugridge, Michael D. Pluth, Bryan E. F. Tiedemann, Valeria Zito, Giuseppe Arena and Kenneth N. Raymond, “External and Internal Guest Binding of a Highly Charged Supramolecular Host in Water: Deconvoluting the Very Different Thermodynamics,” *J. Am. Chem. Soc.* **2010**, *132*, 1005-1009.
496. Jeffrey S. Mugridge, Robert G. Bergman, and Kenneth N. Raymond, “High Precision Measurement of Isotope Effects on Noncovalent Host-Guest Interactions,” *J. Am. Chem. Soc.* **2010**, *132*, 1182–1183.
497. Wassana Yantasee, Glen E. Fryxell, George A. Porter, Kanda Pattamakomsan, Vichaya Sukwarotwat, Wilaiwan Chouyyok, View Koonsiripaiboon, Jide Xu and Kenneth N. Raymond, “Novel Sorbents for Removal of Gadolinium-Based Contrast Agents in Sorbent Dialysis and Hemoperfusion: Preventive Approaches to Nephrogenic Systemic Fibrosis (NSF),” *Nanomedicine* **2010**, *6*, 1-8.
498. Jeffrey S. Mugridge, Robert G. Bergman and Kenneth N. Raymond, “Does Size Really Matter? The Steric Isotope Effect in a Supramolecular Host–Guest Exchange Reaction,” *Angew. Chem. Int. Ed.* **2010**, *49*, 3635 –3637. [Inside cover.](#)
499. Evan G. Moore, Jide Xu, Sheel C. Dodani, Christoph J. Jocher, Anthony D'Aleo, Michael Seitz, and Kenneth N. Raymond, “1-Methyl-3-hydroxy-pyridin-2-one

- Complexes of Near Infra-Red Emitting Lanthanides: Efficient Sensitization of Yb(III) and Nd(III) in Aqueous Solution,” *Inorg. Chem.* **2010**, *49*, 4156–4166.
500. Rosalie K. Hocking, Serena DeBeer George, Kenneth N. Raymond, Keith O. Hodgson, Britt Hedman, and Edward I. Solomon, “Fe L-Edge X-ray Absorption Spectroscopy Determination of Differential Orbital Covalency of Siderophore Model Compounds: Electronic Structure Contributions to High Stability Constants,” *J. Am Chem. Soc.* **2010**, *132*, 4006–4015.
501. Courtney J. Hastings, Michael D. Pluth, Robert G. Bergman and Kenneth N. Raymond, “Enzymelike Catalysis of the Nazarov Cyclization by Supramolecular Encapsulation,” *J. Am Chem. Soc.* **2010**, *132*, 6938–6940.
502. Amanda P. S. Samuel, Jamie L. Lunkley, Gilles Muller, and Kenneth N. Raymond, “Strong Circularly Polarized Luminescence from Highly Emissive Terbium Complexes in Aqueous Solution,” *Eur. J. Inorg. Chem.* **2010**, 3343–3347.
503. Géza Szigethy and Kenneth N. Raymond, “Influence of Linker Geometry on Uranyl Complexation by Rigidly Linked Bis(3-hydroxy-N-methyl-pyridin-2-one),” *Inorg. Chem.* **2010**, *49*, 6755–6765.
504. Jeffrey S. Mugridge, Dorothea Fiedler, and Kenneth N. Raymond, “A Ferrocene-Based Catecholamide Ligand: the Consequences of Ligand Swivel for Directed Supramolecular Self-Assembly,” *J. Coord. Chem.* **2010**, *63*, 2779 – 2789.
505. Kenneth N. Raymond, Daniel L. Wellman, Carmelo Sgarlata, and Aru P. Hill, “Curvature of the Lanthanide Contraction: An Explanation,” *Comptes Rendus Chimie*, **2010**, *13*, 849-852. [Invited paper for issue dedicated to the chemistry of the f-elements in honor of Jean-Claude Bünzli and his retirement from EPFL.](#)
506. Guanhu Bao, Matthew Clifton, Trisha M Hoette, Kiyoshi Mori, Shi-Xian Deng, Andong Qiu, Melanie Viltard, David Williams, Neal Paragas, Thomas Leete, Ritwij Kulkarni, Xiangpo Li, Belinda Lee, Avtandil Kalandadze, Adam J Ratner, Juan Carlos Pizarro, Kai M Schmidt-Ott, Donald W Landry, Kenneth N Raymond, Roland K Strong and Jonathan Barasch, “Iron traffics in circulation bound to a siderocalin (Ngal)–catechol complex,” *Nature Chemical Biology*, **2010**, *6*, 602-609.
507. Rebecca Abergel, Patricia W. Durbin, Birgitta R Kullgren, Shirley Ebbe, Jide Xu, Polly Chang, Deborah I Bunin, Eleanor A Blakely, Kathleen A. Bjornstad, Chris J Rosen, David K Shuh, Kenneth N. Raymond, “Biomimetic Actinide Chelators: An Update on the Preclinical Development of the Orally Active Hydroxypyridonate Decorporation Agents 3,4,3-Li(1,2-Hopo) and 5-Lio(Me-3,2-Hopo),” *Health Physics* **2010**, *99*, 401-407.
508. Evan G. Moore, Jide Xu, Christoph J. Jocher, Todd M. Corneillie, and Kenneth N. Raymond, “Eu(III) Complexes of Functionalized Octadentate 1-Hydroxypyridin-2-ones: Stability, Bioconjugation, and Luminescence Resonance Energy Transfer Studies,” *Inorg. Chem.* **2010**, *49*, 9928–9939.

509. Jeffrey S. Mugridge, Geza Szigethy, Robert G. Bergman, and Kenneth N. Raymond, "Encapsulated Guest–Host Dynamics: Guest Rotational Barriers and Tumbling as a Probe of Host Interior Cavity Space," *J. Am. Chem. Soc.* **2010**, *132*, 16256–16264.
510. Géza Szigethy and Kenneth N. Raymond, "The Influence of the Linker Geometry in Bis(3-hydroxy-N-methyl-pyridin-2-one) Ligands on Solution-Phase Uranyl Affinity," *Chem. Eur. J.* **2011**, *17*, 1818-1827.
511. William C. Floyd, III, Piper J. Klemm, Danil E. Smiles, Ayano C. Kohlgruber, Valérie C. Pierre, Justin L. Mynar, Jean M. J. Fréchet, and Kenneth N. Raymond, "Conjugation Effects of Various Linkers on Gd(III) MRI Contrast Agents with Dendrimers: Optimizing the Hydroxypyridinonate (HOPO) Ligands with Nontoxic, Degradable Esteramide (EA) Dendrimers for High Relaxivity," *J. Am. Chem. Soc.* **2011**, *133*, 2390–2393.
512. Z. Jane Wang, Casey J. Brown, Robert G. Bergman, Kenneth N. Raymond, and F. Dean Toste, "Hydroalkoxylation Catalyzed by a Gold(I) Complex Encapsulated in a Supramolecular Host," *J. Am. Chem. Soc.* **2011**, *133*, 7358–7360.
513. Géza Szigethy and Kenneth N. Raymond, "Hexadentate Terephthalamide(bis-hydroxypyridinone) Ligands for Uranyl Chelation: Structural and Thermodynamic Consequences of Ligand Variation," *J. Am. Chem. Soc.* **2011**, *133*, 7942–7956.
514. Chengbao Ni, David K. Shuh and Kenneth N. Raymond, "Uranyl Sequestration: Synthesis and Structural Characterization of Uranyl Complexes with a Tetradentate Methylterephthalamide Ligand," *Chem. Commun.*, **2011**, *47*, 6392-6394.
515. Jeffrey S. Mugridge, Robert G. Bergman, and Kenneth N. Raymond, "<sup>1</sup>H NMR Chemical Shift Calculations as a Probe of Supramolecular Host–Guest Geometry," *J. Am. Chem. Soc.* **2011**, *133*, 11205–11212.
516. Casey J. Brown, Gregory M. Miller, Miles W. Johnson, Robert G. Bergman, and Kenneth N. Raymond, "High-Turnover Supramolecular Catalysis by a Protected Ruthenium(II) Complex in Aqueous Solution," *J. Am. Chem. Soc.* **2011**, *133*, 11964–11966.
517. Praveena D. Garimella, Ankona Datta, Dante W. Romanini, Kenneth N. Raymond, and Matthew B. Francis, "Multivalent, High-Relaxivity MRI Contrast Agents Using Rigid Cysteine-Reactive Gadolinium Complexes," *J. Am. Chem. Soc.* **2011**, *133*, 14704–14709.
518. Joseph Jankolovits, Christopher M. Andolina, Jeff W. Kampf, Kenneth N. Raymond, and Vincent L. Pecoraro, "Assembly of Near-Infrared Luminescent Lanthanide Host(Host–Guest) Complexes With a Metallacrown Sandwich Motif," *Angew. Chem., Intl. Ed. Engl.* **2011**, *50*, 9660–9664. [Highlighted in \*Nachrichten aus der Chemie\*, \*\*2012\*\*, \*03\*, 241.](#)
519. Trisha M. Hoette, Matthew C. Clifton, Anna M. Zawadzka, Meg A. Holmes, Roland K. Strong, and Kenneth N. Raymond, "Immune Interference in *Mycobacterium tuberculosis* Intracellular Iron Acquisition through Siderocalin Recognition of Carboxymycobactins," *ACS Chem. Biol.* **2011**, *6*, 1327–1331.
520. Courtney J. Hastings, Mikael P. Backlund, Robert G. Bergman, and Kenneth N. Raymond "Enzyme-like Control of Carbocation Deprotonation Regioselectivity in

- Supramolecular Catalysis of the Nazarov Cyclization,” *Angew. Chem., Intl. Ed. Engl.* **2011**, *50*, 10570-10573.
521. Jide Xu, Todd M. Corneillie, Evan G. Moore, Ga-Lai Law, Nathaniel G. Butlin, and Kenneth N. Raymond, “Octadentate Cages of Tb(III) 2-Hydroxyisophthalamides: A New Standard for Luminescent Lanthanide Labels,” *J. Am. Chem. Soc.* **2011**, *133*, 19900–19910.
522. Colin Correnti, Matthew C. Clifton, Rebecca J. Abergel, Ben Allred, Trisha M. Hoette, Mario Ruiz, Ranieri Cancedda, Kenneth N. Raymond, Fiorella Descalzi, and Roland K. Strong, “Galline Ex-FABP Is an Antibacterial Siderocalin and a Lysophosphatidic Acid Sensor Functioning through Dual Ligand Specificities,” *Structure* **2011**, *19*, 1796 – 1806.
523. Manuel Sturzbecher-Hoehne, Clara Ng Pak Leung, Anthony D’Al’eo, Birgitta Kullgren, Anne-Laure Prigent, David K. Shuh, Kenneth N. Raymond, and Rebecca J. Abergel, “3,4,3-LI(1,2-HOPO): *In vitro* formation of highly stable lanthanide complexes translates into efficacious *in vivo* europium decorporation,” *Dalton Trans.* **2011**, *40*, 8340-8346.
524. Kenneth N. Raymond and Casey J. Brown, “Inner and Outer Beauty,” in *Top. Curr. Chem.*, Vol. 323, L. Fabbrizzi, Ed., Springer-Verlag, Berlin, Heidelberg, 2011, pp. 1-18.
525. Rebecca J. Abergel and Kenneth N. Raymond, “Multidentate Terephthalamidate and Hydroxypyridonate Ligands Towards New Orally Active Chelators,” *Hemoglobin* **2011**, *35*, 276–290.
526. Jeffrey S. Mugridge, Robert G. Bergman, and Kenneth N. Raymond, “Equilibrium Isotope Effects on Noncovalent Interactions in a Supramolecular Host–Guest System,” *J. Am. Chem. Soc.* **2012**, *134*, 2057–2066.
527. Ga-Lai Law, Tiffany A. Pham, Jide Xu, and Kenneth N. Raymond, “A Single Sensitizer for the Excitation of Visible and NIR Lanthanide Emitters in Water with High Quantum Yields,” *Angew. Chem., Intl. Ed. Engl.* **2012**, *10*, 2371-2374.
528. Piper J. Klemm, William C. Floyd III, Danil E. Smiles, Jean M. J. Fréchet, and Kenneth N. Raymond, “Improving T1 and T2 Magnetic Resonance Imaging Contrast Agents through the Conjugation of an Esteramide Dendrimer to High-Water-Coordination Gd(III) Hydroxypyridinone Complexes,” *Contrast Media Mol. Imaging* **2012**, *7*, 95-99.
529. Piper J. Klemm, William C. Floyd III, Christopher M. Andolina, Jean M. J. Fréchet, and Kenneth N. Raymond, “Conjugation to Biocompatible Dendrimers Increases Lanthanide  $T_2$  Relaxivity of Hydroxypyridinone Complexes for Magnetic Resonance Imaging,” *Eur. J. Inorg. Chem.* **2012**, 2108–2114. [Invited for the Metal-Based MRI Probes Issue.](#)
530. Alexandra K. Duncan, Piper J. Klemm, Kenneth N. Raymond, and Christopher C. Landry, “Silica Microparticles as a Solid Support for Gadolinium Phosphonate Magnetic Resonance Imaging Contrast Agents,” *J. Am. Chem. Soc.* **2012**, *134*, 8046–8049.
531. Colin Correnti, Vera Richardson, Allyson K. Sia, Ashok D. Bandaranayake, Mario Ruiz, Yohan Suryo Rahmanto, Žaklina Kovačević, Matthew C. Clifton, Margaret A. Holmes, Brett K. Kaiser, Jonathan Barasch, Kenneth N. Raymond, Des R. Richardson, and Roland

- K. Strong, "Siderocalin/Lcn2/NGAL/24p3 Does Not Drive Apoptosis Through Genetic Acid Mediated Iron Withdrawal in Hematopoietic Cell Lines." *PLoS ONE* **2012**, *7*, e43696.
532. Ga-Lai Law, Christopher M. Andolina, Jide Xu, Vinh Luu, Philip X. Rutkowski, Gilles Muller, David K. Shuh, John K. Gibson, and Kenneth N. Raymond, "Circularly Polarized Luminescence of Curium: A New Characterization of the 5f Actinide Complexes," *J. Am. Chem. Soc.* **2012**, *134*, 15545–15549.
533. Tatsuya Fukushima, Allyson K. Sia, Benjamin E. Allred, Rita Nichiporuk, Zhongrui Zhou, Ulla N. Andersen, and Kenneth N. Raymond, "Bacillus cereus Iron Uptake Protein Fishes Out an Unstable Ferric Citrate Trimer," *Proc. Natl. Acad. Sci.* **2012**, *109*, 16829–16834. [Featured in 10/8/12 issue of C&N.](#)
534. William M. Hart-Cooper, Kristen N. Clary, F. Dean Toste, Robert G. Bergman, and Kenneth N. Raymond, "Selective Monoterpene-like Cyclization Reactions Achieved by Water Exclusion from Reactive Intermediates in a Supramolecular Catalyst," *J. Am. Chem. Soc.* **2012**, *134*, 17873–17876.
535. Christopher M. Andolina, Piper J. Klemm, William C. Floyd, III, Jean M. J. Fréchet, and Kenneth N. Raymond, "Analysis of Lanthanide Complex Dendrimer Conjugates for Bimodal NIR and MRI Imaging," *Macromolecules* **2012**, *45*, 8982–8990.
536. Z. Jane Wang, Kristen N. Clary, Robert G. Bergman, Kenneth N. Raymond, and F. Dean Toste "A Supramolecular Approach to Combining Enzymatic and Transition Metal Catalysis," *Nature Chemistry* **2013**, *5*, 100–103.
537. Allyson K. Sia, Benjamin E. Allred and Kenneth N. Raymond, "Siderocalins: Siderophore binding proteins evolved for primary pathogen host defense," *Curr. Opin. Chem. Biol.* **2013**, *17*, 150–157.
538. Michael B. Winter, Piper J. Klemm, Christine M. Phillips-Piro, Kenneth N. Raymond, and Michael A. Marletta, "Porphyrin-Substituted H-NOX Proteins as High-Relaxivity MRI Contrast Agents," *Inorg. Chem.* **2013**, *52*, 2277–2279.
539. Jeffrey S. Mugridge, Achim Zahl, Rudi van Eldik, Robert G. Bergman, and Kenneth N. Raymond, "Solvent and Pressure Effects on the Motions of Encapsulated Guests: Tuning the Flexibility of a Supramolecular Host," *J. Am. Chem. Soc.* **2013**, *135*, 4299–4306.
540. Benjamin E. Allred, Allyson K. Sia and Kenneth N. Raymond, "Siderocalin Combats Mycobacterial Infections," in *Iron Acquisition by the Genus Mycobacterium*, Vol. 92, B.R. Byers, Ed., SpringerBriefs in Biometals, Springer International Publishing AG, Gewerbstrasse, 2013, pp. 53–64.
541. Benjamin E. Allred, Colin Correnti, Matthew C. Clifton, Roland K. Strong, and Kenneth N. Raymond, "Siderocalin Outwits the Coordination Chemistry of Vibriobactin, a Siderophore of Vibrio cholera," *ACS Chem. Biol.* **2013**, ASAP.
542. Tatsuya Fukushima, Benjamin E. Allred, Allyson K. Sia, Rita Nichiporuk, Ulla N. Andersen, and Kenneth N. Raymond, "Gram-positive siderophore-shuttle with iron-



- exchange from Fe-siderophore to apo-siderophore by *Bacillus cereus* YxeB,” *Proc. Natl. Acad. Sci. U.S.A.* **2013**, *110*, 13821-13826.
543. Hemant Naikare, James Butcher, Annika Flint, Jide Xu, Kenneth N. Raymond, and Alain Stintzi, “*Campylobacter jejuni* ferric-enterobactin receptor CfrA is TonB3 dependent and mediates iron acquisition from structurally different catechol siderophores,” *Metallomics* **2013**, *5*, 988-996.