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Education and Experience

B.S., Chemistry, 1960, National Taiwan University
Ph.D., Chemistry, 1967, University of California, Irvine, California
(Advisor: Professor F. Sherwood Rowland, Nobel Laureate, Chemistry 1995)
Postdoctoral, 1967-69, University of California, Los Angeles, California
Assistant Professor, 1969-73; Associate Professor, 1973-78; Professor 1978-present,
University of Idaho
Visiting Faculty, 1975-76, Institute of Geophysics and Planetary Physics, University of
California, Los Angeles
Scientist in Residence, 1982-83, Chemical Technology Division, Argonne National Lab,
Argonne, Illinois
NORCUS Visiting Faculty, 1990, Battelle Pacific Northwest Lab, Richland, Washington
Research Fellow, 1991, Japan Atomic Energy Research Institute, Tokai, Japan
Chair, Department of Chemistry, University of Idaho; July 1, 1997 – June 30, 2002
Visiting Professor, Nagoya University, Japan; October 10, 2002 – January 10, 2003

Current Research Interests

Supercritical fluid extraction of metals and radioisotopes; environmentally sustainable
methods for nuclear waste treatment; synthesis of metal nanoparticles and catalysis in
supercritical fluids.

Awards

University of Idaho, Annual Award for Teaching Excellence, 1990
University of Idaho, Annual Award for Research Excellence, 1991
S.T. Li Prize for Achievements in Science and Technology, 2004

Refereed Publications

1. C. M. Wai, C. T. Ting, and F. S. Rowland, "The Stereochemistry of the Replacement
of Chlorine Atoms in Alkyl Halides by Cl^{38} Activated in the (n,γ) Process," *J.*
Amer. Chem. Soc., **86**, 2525- 2526 (1964).
2. F. S. Rowland, C. M. Wai, C. T. Ting, and G. Miller, "The Stereochemistry of the
Reactions of (n,γ) Halogen Atoms with Alkyl Halides in the Liquid Phase,"
Chemical Effects of Nuclear Transformations, International Atomic Energy
Agency, Vienna, (1965), Vol. 1, pp. 333-344.

3. C. M. Wai and F. S. Rowland, "The Retention of Optical Configuration during Energetic Chlorine Atom Exchange in Gaseous Alkyl Halides," *J. Phys. Chem.*, 71, 2752-2753 (1967).
4. C. M. Wai and F. S. Rowland, "The Reactions of Energetic Chlorine Atoms with Methyl Chloride in the Gas Phase," *J. Amer. Chem. Soc.*, 90, 3638-3646 (1968).
5. C. M. Wai and F. S. Rowland, "The Substitution of Energetic Chlorine Atoms for Hydrogen Atoms in Butyl Chlorides," *J. Phys. Chem.*, 72, 3049-3052 (1968).
6. C. M. Wai, G. W. Wetherill, and J. T. Wasson, "The Distribution of Trace Quantities of Germanium between Metal, Silicate, and Sulfide Phases," *Geochim. et Cosmochim. Acta*, 32, 1269-1278 (1968).
7. C. M. Wai and F. S. Rowland, "Thermal and Hot Reactions of Chlorine Atoms with cis- and trans-1,2-Dichloroethylene," *J. Amer. Chem. Soc.*, 91, 1053-1057 (1969).
8. C. M. Wai and J. T. Wasson, "Silicon Concentrations in the Metal of Iron Meteorites," *Geochim. et Cosmochim. Acta*, 33, 1465-1471 (1969).
9. C. M. Wai and F. S. Rowland, "The Stereochemistry of Energetic Chlorine Atom Exchange in Alkyl Halides," *J. Phys. Chem.*, 74, 434-438 (1970).
10. C. M. Wai and J. T. Wasson, "Composition of the Metal Schreibersite, and Perryite and Enstatite Achondrites and the Origin of Enstatite Chondrites and Achondrites," *Geochim. et Cosmochim. Acta*, 34, 169-184 (1970).
11. C. M. Wai and J. T. Wasson, "Silicon in the Nedagolla Ataxite and the Relationship between Si and Cr in Reduced Iron Meteorites," *Geochim. et Cosmochim. Acta*, 34, 408-410 (1970).
12. W. G. Ernst and C. M. Wai, "Mossbauer, Infrared, X-ray and Optical Study of Cation Ordering and Dehydrogenation in Natural and Heat-treated Sodic amphiboles," *Amer. Min.*, 55, 1226-1258 (1970).
13. C. M. Wai, "The Metal Phase of Horse Creek, Mount Egerton and Norton County Enstatitic Meteorites," *Min. Mag.*, 37, 905-908 (1970).
14. Y. Hariya and C. M. Wai, "The Stability and Phase Transition of the System $\text{Fe}_2\text{GeO}_4\text{-Fe}_2\text{SiO}_4$," *Journal of the Faculty of Science, Hokkaido University, Japan, Series IV, Vol. XIV, No. 4*, 355- 363 (1970).
15. C. M. Wai and D. Jennings, "Recoil Bromine Reaction: The Decomposition of Excited Cyclopropyl Bromide," *J. Phys. Chem.*, 75, 2698-2700 (1971).
16. C. M. Wai and C. Knowles, "The Metal Phase of Bustee Enstatite Achondrite," *Min. Mag.*, 38, 627-629 (1972).
17. R. M. Rosain and C. M. Wai, "The Rate of Loss of Mercury from Aqueous Solution when Stored in Various Containers," *Anal. Chim. Acta*, 65, 279-284 (1973).
18. P. Davanloo and C. M. Wai, "Recoil Tritium Reactions with Cyclopropyl Bromide," *Radiochim. Acta*, 19, 58-61 (1973).
19. J. Rodriguez and C. M. Wai, "Recoil Chlorine Reaction. The Isomerization of Excited 1,1- Dichlorocyclopropane," *Radiochim. Acta*, 19, 169-172 (1973).
20. C. M. Wai, "Geochemical Affinities of Cobalt and Germanium toward Metal, Silicate and Sulfide Phases at High Temperature," *Geochim. et Cosmochim. Acta*, 38, 1821-1825 (1974).
21. G. King, J. Rodriguez, and C. M. Wai, "Losses of Trace Concentrations of Cadmium from Water during Storage," *Anal. Chem.*, 46, 771-773 (1974).

22. D. Maxfield, J. Rodriguez, M. Buettner, J. Davis, L. Forbes, R. Kovacs, W. Russel, L. Schultz, R. Smith, J. Stanton, and C. M. Wai, "Heavy Metal Content in the Sediments of the Southern Part of the Coeur d'Alene Lake," *Environ. Pollution*, 6, 263-266 (1974).
23. D. Maxfield, J. Rodriguez, M. Buettner, J. Davis, L. Forbes, R. Kovacs, W. Russel, L. Schultz, R. Smith, J. Stanton, and C. M. Wai, "Heavy Metal Pollution in the Sediments of the Coeur d'Alene River Delta," *Environ. Pollution*, 7, 1-6 (1974).
24. J. M. Rodriguez, J. M. Lo, and C. M. Wai, "Effects of Gas Additives on Isomeric Transition Activated Br⁸² Reactions with Dibromomethane," *Radiochem. Radioanal. Letters*, 20, 353-361 (1975).
25. J. M. Lo and C. M. Wai, "Mercury Loss from Water during Storage: Mechanisms and Prevention," *Anal. Chem.*, 47, 1869-1870 (1975).
26. J. T. Wasson and C. M. Wai, "Explanation for the Very Low Ga and Ge Concentrations in Some Iron Meteorite Groups," *Nature*, 261, 114-116 (1976).
27. J. T. Wasson, W. V. Bonton, G. W. Kallemeyn, L. L. Sundberg, and C. M. Wai, "Volatile Compounds Released during Lunar Lava Fountaining," *Proc. Lunar Sci. Conf.* (1976), pp. 1583- 1595.
28. R. D. Johnson, R. J. Miller, R. E. Williams, C. M. Wai, A. C. Weese, and J. E. Mitchell, "Heavy Metal Problem of Silver Valley, Northern Idaho," *Proc. International Conf. on Heavy Metals in the Environ.*, National Research Council of Canada, Ottawa (1976), pp. 465-485.
29. W. G. King and C. M. Wai, "Recoil Tritium Reactions with cis- and trans-1-2-Dichloroethylene," *Radiochem. Radioanal. Letters*, 30, 27-34 (1977).
30. C. M. Wai and J. T. Wasson, "Nebular Condensation of Moderately Volatile Elements and their Abundance in Ordinary Chondrites," *Earth & Planetary Sci. Letters*, 36, 1-13 (1977).
31. D. E. Reece, J. A. Felkey, and C. M. Wai, "Heavy Metal Pollution in the Sediments of the Coeur d'Alene River, Idaho," *Environ. Geol.*, 2, 289-293 (1978).
32. C. M. Wai, C. R. Knowles, and J. F. Keely, "Lead Caps on Wine Bottles and their Potential Problems," *Bull. Environm. Contam. Toxicol.*, 21, 4-6 (1979).
33. F. Hutchison, C. M. Wai, M. Jernegan, W. Hick, and R. Long, "Distribution of Cadmium, Lead, and Zinc in Soil around Two Phosphate Processing Plants in Pocatello, Idaho," *Bull. Environm. Contam. Toxicol.*, 22, 426-429 (1979).
34. F. Hutchison and C. M. Wai, "Cadmium, Lead, and Zinc in Reclaimed Phosphate Mine Waste Dumps in Idaho," *Bull. Environm. Contam. Toxicol.*, 23, 377-380 (1979).
35. C. M. Wai and J. T. Wasson, "Nebular Condensation of Ga, Ge, and Sb, and the Chemical Classification of Iron Meteorites," *Nature*, 282, 790-793 (1979).
36. R. Johnson, C. M. Wai, B. McVeety, H. Lee, and H. Willmes, "Uranium in Soil around Phosphate Processing Plants in Pocatello, Idaho," *Bull. Environm. Contam. Toxicol.*, 24, 735-738 (1980).
37. J. T. Wasson, J. Willis, C. M. Wai, and A. Kracher, "Origin of Iron Meteorite Groups IAB and IIICD," *Z. Naturforsch.*, 35A, 781-795 (1980).
38. C. M. Wai, D. E. Reece, B. D. Trexler, D. R. Ralston, and R. E. Williams, "Production of Acid Water in a Lead-Zinc Mine, Coeur d'Alene, Idaho," *Environ. Geol.*, 3, 159-162 (1980).

39. C. M. Melville, C. M. Wai, M. Collopy, and H. Willmes, "Uranium Dispersion Along Roads Paved with Phosphate Slag," *Bull. Environm. Contam. Toxicol.*, 27, 470-473 (1981).
40. C. M. Wai, "Deuterium Isotope Effect in Recoil ^{38}Cl Substitution Reactions with Liquid Chloroform," *Radiochem. Radioanal. Letters*, 49, 365-370 (1981).
41. C. M. Wai and J. M. Lo, "Extraction and Separation of ^{210}Pb , ^{210}Bi , and ^{210}Po by Diethyldithio- carbamate," *Radiochem. Radioanal. Letters*, 50, 293-298 (1982).
42. J. M. Lo, J. C. Yu, F. I. Hutchison, and C. M. Wai, "Solvent Extraction Dithiocarbamate Complexes and Back-Extraction with Mercury(II) for Determination of Trace Metals in Seawater by Atomic Absorption Spectrometry," *Anal. Chem.*, 54, 2536-2539 (1982).
43. J. M. Lo and C. M. Wai, "Determination of Extraction Constants for Polonium Dithiocarbamate by Substoichiometric Extraction," *Anal. Chim. Acta*, 148, 327-330 (1983).
44. J. C. Yu, J. M. Lo, and C. M. Wai, "Extraction of Gold and Mercury from Sea Water with Bismuth Diethyldithiocarbamate Prior to Neutron Activation - Gamma Spectrometry," *Anal. Chim. Acta*, 154, 307-312 (1983).
45. W. M. Mok, H. Willmes, and C. M. Wai, "Solvent Extraction of Uranyl Dithiocarbamate Complexes for Neutron Activation Analysis," *Radiochem. Radioanal. Letters*, 59, 329-336 (1983).
46. W. M. Mok and C. M. Wai, "Preconcentration with Dithiocarbamate Extraction for Determination of Molybdenum in Seawater by Neutron Activation Analysis," *Anal. Chem.*, 56, 27-29 (1984).
47. C. M. Wai and J. M. Lo, "A New Method of Separating ^{210}Pb from Ra-DEF for Radioactive Equilibrium Experiment," *J. Chem. Edu.*, 61, 257-58 (1984).
48. C. M. Wai and M. Blander, "Determination of the Stability of the AlO^+ Complex in Alkali Halide Melts," *Z. Naturforsch.*, 39A, 499-502 (1984).
49. J. C. Yu and C. M. Wai, "Dithiocarbamate Extraction of Gallium from Natural Waters and from Biological Samples for Neutron Activation Analysis," *Anal. Chem.*, 56, 1689-91 (1984).
50. W. M. Mok, H. Willmes and C. M. Wai, "Extraction of Molybdenum from Biological Samples and from Coal Fly Ash for Neutron Activation Analysis," *Anal. Chem.*, 56, 2623 (1984).
51. N. K. Shah and C. M. Wai, "Extraction of Palladium from Natural Water and from Coal Fly Ash for Neutron Activation Analysis," *J. Radioanal. Nucl. Chem. Letters*, 94, 129-38 (1985).
52. W. M. Mok, N. K. Shah, and C. M. Wai, "Extraction of As(III) and As(V) from Natural Waters for Neutron Activation Analysis," *Anal. Chem.*, 58, 110-113 (1986).
53. Y. Q. Huang and C. M. Wai, "Extraction of Arsenic from Soil Digest with Dithiocarbamates for ICP-AES Analysis," *Commu. Soil Sci. Plant Anal.*, 19, 125-133 (1986).
54. N. M. Hani, C. M. Wai, and H. Willmes, "Dithiocarbamate Extraction of Trace Amounts of Selenium from Biological Samples for Neutron Activation Analysis," *J. Radioanal. Nucl. Chem. Lett.*, 104, 19-28 (1986).

55. J. Tang and C. M. Wai, "Solvent Extraction of Lanthanides with a Crown Ether Carboxylic Acid," *Anal. Chem.*, 58, 3233-3235 (1986).
56. C. M. Wai and M. E. Dysart, "Determination of Oxygen in Molten Alkali Halide Salts by Proton Activation Analysis," *Anal. Chem.*, 58, 3266-3269 (1986).
57. W. M. Mok and C. M. Wai, "Simultaneous Extraction of Trivalent and Pentavalent Antimony and Arsenic Species from Natural Waters for Neutron Activation Analysis," *Anal. Chem.*, 59, 233-236 (1987).
58. B. A. Detering, J. A. Batdorf, and C. M. Wai, "Reduction of Selected Metal Oxides in a Thermal Plasma Produced by a Nontransferred Arc Troch," *Mater. Res. Soc. Symp. Proc.*, 98, 359-364 (1987).
59. C. M. Wai, L. M. Tsay, and J. C. Yu, "A Two-Step Extraction Method for Differentiating Chromium Species in Water," *Microchim. Acta II*, 73-78 (1987).
60. C. M. Wai, M. E. Dysart, M. Blander, R. R. Heinrich, and M. C. Oselka, "Determination of Oxygen in Alkali Halide Salts by Proton Activation Analysis," *J. Radioanal. Nucl. Chem.*, 124, 21-32 (1988).
61. J. Tang and C. M. Wai, "Transport of Trivalent Lanthanides in a H₂O-CHCl₃-H₂O Liquid Membrane System Containing a Crown Ether Carboxylic Acid," *J. Membrane Sci.*, 35, 339-345 (1988).
62. W. M. Mok and C. M. Wai, "Determination of Arsenic and Antimony in Biological Materials by Solvent Extraction and Neutron Activation," *Talanta*, 35, 183-186 (1988).
63. S. G. Hutchison, L. S. Richardson, and C. M. Wai, "Carbothermic Reduction of Silicon Dioxide - A Thermodynamic Investigation," *Metallurgical Transactions B*, 19B, 249-253 (1988).
64. W. M. Mok and C. M. Wai, "Arsenic Speciation and Quality of Ground Water in a Lead-Zinc Mine in Idaho," *Water Research*, 22, 769-774 (1988).
65. J. Tang and C. M. Wai, "Extraction of Uranium with Crown Ether Carboxylic Acids for Neutron Activation Analysis," *J. Radioanal. Nucl. Chem. Letters*, 128, 61-69 (1988).
66. W. M. Mok and C. M. Wai, "Distribution and Mobilization of Arsenic Species in the Creeks around the Blackbird Mining District, Idaho," *Water Research*, 23, 7-13 (1989).
67. C. M. Wai and S. G. Hutchison, "Free Energy Minimization Calculation of Complex Chemical Equilibria - Reduction of Silicon Dioxide with Carbon at High Temperature," *J. Chem. Edu.*, 66, 546-549 (1989).
68. C. M. Wai and S. G. Hutchison, "Evaluation of Thermodynamic Data of Aluminum Chloride Hexahydrate and Its Dehydration," *Thermochim. Acta*, 114, 241-247 (1989).
69. N. K. Shah and C. M. Wai, "Preconcentration of Trace Metals on C18-bonded Silica Gel for Neutron Activation Analysis," *J. Radioanal. Nucl. Chem.*, 130, 451-459 (1989).
70. J. Tang and C. M. Wai, "Enhanced Extraction of Lanthanides with Crown Ether Carboxylic Acids of Increasing Lipophilicity," *Analyst*, 114, 451-453 (1989).
71. S. Huang, K. Daehling, T. E. Carleson, P. Taylor, C. M. Wai, and A. Propp, "Thermodynamic Analysis of Corrosion of Iron Alloys in Supercritical Water," in

- Supercritical Fluid Science and Technology*, Editors, Johnson and Penninger, ACS Symposium Series 406, Chapter 18, 1989.
72. S. Huang, K. Daehling, T.E. Carleson, M. Abdel-Latif, P. Taylor, C.M. Wai, and A. Proff, "Electrochemical Measurements of Corrosion of Iron Alloys in Supercritical Water," in *Supercritical Science & Technology*, Editors Johnson & Penninger, ACS Symposium Series 406, Chapter 19, 1989.
 73. J. Tang and C. M. Wai, "Preconcentration of Lanthanides from Natural Waters with a Lipophilic Crown Ether Carboxylic Acid for Neutron Activation Analysis," *Talanta*, 36, 1129-1133 (1989).
 74. J. Tang and C. M. Wai, "Transport of Trivalent Lanthanides Through a Surfactant Membrane Containing an Ionizable Macrocyclic Polyether," *J. Membr. Sci.*, 46, 349-356 (1989).
 75. W. M. Mok and C. M. Wai, "Distribution and Mobilization of Arsenic and Antimony Species in the Coeur d'Alene River, Idaho," *Environ. Sci. Technol.*, 24, 102-108 (1990).
 76. C. M. Wai, Ira Bloom, Deanna Caveny, and Milton Blander, "The Solubility of CoCl_2 in Molten NaCl-AlCl_3 ," *J. Phys. Chem.*, 94, 1666-1669 (1990).
 77. C. M. Wai and S. G. Hutchison, "A Thermodynamic Study of the Carbothermic Reduction of Alumina in Plasma," *Metallurgical Transactions B*, 21B, 406-408 (1990).
 78. C. M. Wai and H. S. Du, "Separation of ^{90}Y and ^{90}Sr on Papers Impregnated With Crown Ether Carboxylic Acids," *Anal. Chem.*, 62, 2412-2414 (1990).
 79. C. M. Wai and K. T. Liu, "The Origin of White Lead - from the East or the West," *J. Chem. Edu.*, 62, 25-28 (1991).
 80. J. J. Yu and C. M. Wai, "Chromatographic Separation of Arsenic Species with Sodium Bis(trifluoroethyl)dithiocarbamate Chelation," *Anal. Chem.*, 63, 842-845 (1991).
 81. X. B. Xia, M. S. Munsey, H. S. Du, C. M. Wai and N. R. Natale, "Preparation of Crown Ethers with Isoxazolyl-Lariats: Homologation of Isoxazole Aldehydes and a Critical Comparison of Lariat Functional Moieties for Lanthanide Extraction," *Heterocycles*, 32, 711-720 (1991).
 82. K. E. Laintz, C. M. Wai, C. R. Yonker and R. D. Smith, "Solubility of Fluorinated Metal Diethyldithiocarbamate in Supercritical Carbon Dioxide," *J. Supercritical Fluid*, 4(3), 194-198 (1991).
 83. C. M. Wai, H. S. Du, Y. Meguro and Z. Yoshida, "Selective Extraction and Separation of Actinides with Ionizable Crown Ethers," *Anal. Sci.*, 7(supplement), 41-44 (1991).
 84. Robert Frazier and C. M. Wai, "Enhanced Separation of Trivalent Lanthanoids by Solvent Extraction with 18-Crown-6 and EDTA Complexonate," *Talanta*, 39, 211-214 (1992).
 85. K. E. Laintz, J. J. Yu and C. M. Wai, "Separation of Metal Ions with Sodium Bis(trifluoroethyl)dithiocarbamate Chelation and Supercritical Fluid Chromatography," *Anal. Chem.*, 64, 311-315 (1992).
 86. Robert Frazier and C. M. Wai, "The Effect of Solvents on the Extraction of Lanthanoids with 18-Crown-6 and Trichloroacetate," *J. Radioanal. Nucl. Chem.*, 159, 63-69 (1992).

87. K. E. Laintz, G. M. Shieh and C. M. Wai, "Simultaneous Determination of Arsenic and Antimony Species in Environmental Samples Using Bis(trifluoroethyl)dithiocarbamate Chelation and Supercritical Fluid Chromatography," *J. Chromatogr. Sci.*, **30**, 120-124 (1992).
88. K. E. Laintz, C. M. Wai, C. R. Yonker and R. D. Smith, "Extraction of Metal Ions from Liquid and Solid Materials by Supercritical Carbon Dioxide," *Anal. Chem.*, **64**, 2875-2878 (1992).
89. T. E. Carleson, S. Chandra, C. M. Wai, L. L. Wai and S. S. Huang, "Group Contribution Method for Estimating the Solubility of Selected Hydrocarbon Solutes in Supercritical Carbon Dioxide," in *Supercritical Fluid Engineering Science*, E. Kiran and J. F. Brennecke, Eds., ACS Symposium Series 514, Ch. 6, 66-73 (1992).
90. H. S. Du, D. J. Wood, S. Elshani and C. M. Wai, "Separation of Thorium from Lanthanides by Solvent Extraction with an Ionizable Crown Ether," *Talanta*, **40**, 173-177 (1993).
91. D. J. Wood, S. Elshani, H. S. Du, N. R. Natale and C. M. Wai, "Separation of ^{90}Y from ^{90}Sr by Solvent Extraction with Ionizable Crown Ethers," *Anal. Chem.*, **65**, 1350-1354 (1993).
92. C. M. Wai, Yuehe Lin, R. Brauer, S. F. Wang and W. F. Beckert, "Supercritical Fluid Extraction of Organic and Inorganic Mercury from Solid Materials," *Talanta*, **40**, 1325 (1993).
93. Y. Lin, R. D. Brauer, K. E. Laintz and C. M. Wai, "Supercritical Fluid Extraction of Lanthanides and Actinides from Solid Materials with a Fluorinated beta-Diketone," *Anal. Chem.*, **65**, 2549 (1993).
94. D. J. Wood, S. Elshani, C. M. Wai, R. A. Bartsch, M. Huntley, S. Hartenstein, "Column Chromatographic Separation of Y^{3+} from Sr^{2+} by Polymeric Ionizable Crown Ether Resins," *Anal. Chim. Acta*, **284**, 37-43 (1993).
95. S. L. Chen, S. R. Dzung, M. S. Yang, K. W. Chiu, G. M. Shieh and C. M. Wai, "Arsenic Species in Ground Waters of the Blackfoot Disease Area, Taiwan," *Environ. Sci. Technol.*, **28**, 877-881 (1994).
96. Y. Lin and C. M. Wai, "Supercritical Fluid Extraction of Lanthanides with Fluorinated β - Diketones and Tributyl Phosphate," *Anal. Chem.*, **66**, 1971-75 (1994).
97. Y. Lin, C. M. Wai, F. M. Jean and R. D. Brauer, "Supercritical Fluid Extraction of Thorium and Uranium Ions from Solid and Liquid Materials with Fluorinated β - Diketones and Tributyl Phosphate," *Environ. Sci. Technol.*, **28**, 1190-93 (1994).
98. S. Wang and C. M. Wai, "Separation of Metal Dithiocarbamate Complexes by High-Performance Liquid Chromatography," *J. Chromatogr. Sci.*, **32**, 506-510 (1994).
99. S. Elshani, P. Apgar, S. Wang and C. M. Wai, "New Proton-Ionizable Macrocyclic Compounds Containing One and Two Triazole Subcyclic Units - Synthesis and Complexation Properties," *J. Heterocycl. Chem.*, **31**, 1271-74 (1994).
100. M. K. Beklemishev, S. Elshani and C. M. Wai, "Solvent Extraction of Radium with Crown Ether Carboxylic Acids," *Anal. Chem.*, **66**, 3521-24 (1994).
101. W.M. Mok and C. M. Wai, "Mobilization of Arsenic in Contaminated River Water", *Adv. Environ. Sci. Technol.*, **26**, 99-117 (1994).

102. C. M. Wai, "Supercritical Fluid Extraction of Trace Metals from Solid and Liquid Materials for Analytical Applications," *Anal. Sci.*, 11, 165-167 (1995).
103. S. G. Hutchison, C. M. Wai, J. Dong and R. J. Kearney, "Titanium Production in a Plasma Reactor: A Feasibility Investigation," *Plasma Chem. & Plasma Proc.*, 15, 353-367 (1995).
104. S. Wang, S. Elshani and C. M. Wai, "Selective Extraction of Mercury with Ionizable Crown Ethers in Supercritical Carbon Dioxide," *Anal. Chem.*, 67, 919-923 (1995).
105. Y. Lin, N. G. Smart and C. M. Wai, "Supercritical Fluid Extraction and Chromatography of Metal Chelates and Organometallic Compounds," *Trends in Anal. Chem.*, 14, 123-133 (1995).
106. Yuehe Lin, N.G. Smart and C.M. Wai, "Supercritical Fluid Extraction of Uranium and Thorium from Nitric Acid Solutions with Organophosphorus Reagents", *Environ. Sci. Technol.*, 29, 2706-2708 (1995).
107. K.L. Toews, R.M. Stroll, C.M. Wai and N.G. Smart, "An Examination of pH Defining Equilibrium Between Water and Supercritical CO₂ – Influence on SFE of Organics and Metal Chelates", *Anal. Chem.*, 67, 4040-4043 (1995).
108. H.S. Du, G.Z. Dong, X.Y. Yang, G.H. Li and C.M. Wai, "Development of Methods for the Preparation of Highly Purified ⁹⁰Y", *Microchem. J.*, 53, 231-235 (1995).
109. Hongshan Du and C.M. Wai, "Study of Solvent Extraction of ⁹⁰Y from ⁹⁰Sr-⁹⁰Y with sym-Dibenzo-16-crown-5-oxyacetic acid", *He Huaxue Yu Fangshe Huaxue*, 17, 105-109 (1995).
110. K. L. Toews, N. G. Smart, and C. M. Wai, "Complexation and Transport of Uranyl Nitrate in Supercritical Carbon Dioxide with Organophosphorus Reagents", *Radiochim. Acta*, 75, 179-184 (1996).
111. C. L Phelps, N. G. Smart, C. M. Wai, "Past, Present and Possible Future Applications of Supercritical Fluid Extraction Technology", *J. Chem. Edu.*, 12, 1163-1168 (1996).
112. H. Wu, Y. Lin, N. G. Smart, and C. M. Wai, "Separation of Lanthanide Beta-Diketonates by Adduct Formation/Supercritical Fluid Chromatography", *Anal. Chem.*, 68, 4072-4075 (1996).
113. S. Wang and C. M. Wai, "Supercritical Fluid Extraction of Bioaccumulated Mercury from Aquatic Plants", *Environ. Sci. Technol.*, 30, 3111-3114, (1996).
114. C. M. Wai, S. Wang, Y. Liu, V. Lopez-Avila, and W. F. Beckert, "Evaluation of Dithiocarbamates and Beta-Diketones as Chelating Agents in Supercritical Fluid Extraction of Cd, Pb, and Hg from Solid Samples", *Talanta*, 43, 2083-2091 (1996).
115. C. M. Wai, S. Wang, and J. J. Yu, "Solubility Parameter and Solubility of Metal Dithiocarbamates in Supercritical Carbon Dioxide", *Anal. Chem.*, 68, 3516-3519 (1996).
116. N.G. Smart, Y. Lin and C.M. Wai, "Metal Extraction processes Using Supercritical Fluids", *ICHEME Res. Event. Eur. Conf. Young Res. Chem. Eng. 2nd*, 1, 322-324 (1996).
117. N. G. Smart, Y. Lin, and C. M. Wai, "Supercritical Fluid Extraction of Metal Ions from Solid Samples", *Amer. Environ. Lab.*, February, 1996, p.38-42.

118. H. S. Du, G. Q. Li, G. Z. Dong, K. H. Chiu, C. M. Wai, "A New Method of Uranium Preseparation and Concentration for Neutron Activation Analysis", *J. Radioanal. Nucl. Chem.*, 205, 311-318 (1996).
119. H.S. Du, G. Li, G. Dong, J. Li, K.H. Chiu, C.M. Wai, "Progress in Neutron Activation Analysis of Uranium", *Science in China, Series B: Chemistry*, 39(2), 219-224 (1996).
120. C.M. Wai and S. Wang, "Supercritical Fluid Extraction: Metals as Complexes", *J. Chromatography A*, 785, 369-383 (1997).
121. N. G. Smart, T. E. Carleson, S. Elshani, S. Wang, and C. M. Wai, "Extraction of Toxic Heavy Metals using Supercritical Fluid Carbon Dioxide Containing Organophosphorus Reagents", *Ind. Eng. Chem. Res.*, 36, 1819-1826 (1997).
122. R. D. Brauer, T. E. Bitterwolf, N. G. Smart, M. D. Burford, C. M. Wai, "Prediction of Retention Behavior of Ferrocene Derivatives in Supercritical Fluid Chromatography", *Anal. Chim. Acta*, 349, 239-244 (1997).
123. S.L. Wallen, C.R. Yonker, C. L. Phelps, C.M.Wai, "Effect of Fluorine Substitution, Pressure and Temperature on the Tautomeric Equilibria and Hydrogen Bonding of Beta-Diketones", *J. Chem. Soc, Faraday Trans.*, 93, 2391-2394 (1997).
124. Chien M. Wai, "Supercritical Fluid Extraction of Lanthanides and Actinides", *Recent Progr. Actinides Sep. Chem. Proc., Workshop Actinides Solution Chem. WASC '94*, 222-237 (1997).
125. N. G. Smart, T. E. Carleson, T. Kast, A. A. Clifford, M. D. Burford, and C. M. Wai, "Solubility of Chelating Agents and Metal Containing Compounds in Supercritical Fluid Carbon Dioxide - A Review", *Talanta*, 44, 137-150 (1997).
126. Fred Hunt, E.G. Babaraj, F.H. Froes, C.M. Wai, "Making Copper and Tin Dioxide Particles in Supercritical Carbon Dioxide", *Advanced Particulate Materials and Processes, Proceedings of the 5th International Conferences*, 477-481 (1997).
127. M. J. Carrott, B. E. Waller, N. G. Smart, C. M. Wai, "High Solubility of $\text{UO}_2(\text{NO}_3)_2 \cdot 2\text{TBP}$ complex in Supercritical CO_2 ", *J.C.S. Chem. Commun.*, 373-374 (1998).
128. X. Chen, M. Ji, D. R. Fisher, C. M. Wai, "Carboxylate-Derived Calixarenes with High Selectivity for Actinium-225", *J. C. S. Chem. Commun.*, 377-378 (1998).
129. M. Carrott and C. M. Wai, "UV-Vis Spectroscopic Measurement of Solubilities in Supercritical CO_2 Using High Pressure Fibre Optic Cells", *Anal. Chem.*, 70, 2421-2425 (1998).
130. Y. Lin, H. Wu, N. G. Smart, and C. M. Wai, "Investigation of Adducts of Lanthanide and Uranium Beta-Diketonates with Organophosphorus Lewis Bases by Supercritical Fluid Chromatography", *J. Chromatography A*, 793, 107-113 (1998).
131. C.M. Wai, Fred Hunt, Min Ji, Xiaoyuan Chen, "Chemical Reactions in Supercritical Carbon Dioxide", *J. Chem. Edu.*, 75, 1641-45 (1998).
132. T.D. Clarke, C.M. Wai, "Selective Removal of Cesium from Acid Solutions with Immobilized Copper Ferrocyanide", *Anal. Chem.*, 70, 3708-3711 (1998).

133. R.S. Addleman, J.W. Hills, C.M. Wai, "A High Pressure Flow Cell for On-Line Absorption, Raman, and Time Resolved Laser Induced Fluorescence Spectroscopy in Supercritical Fluids", *Rev. Sci. Instru.*, 69 (9), 3127-3131 (1998).
134. N.G. Smart, C.L. Phelps, C.M. Wai, "Supercritical Solutions", *Chemistry in Britain*, 34 (8), 34-36, (1998).
135. S. Elshani, R. Noriyuki, C.M. Wai, N.R. Natale, R.A. Bartsch, "New Iariat Ether Carboxylic and Hydroxamic Acids: Synthesis and Lanthanide Ion Complexation", *J. Heterocyclic Chem.*, 35, 875-885 (1998).
136. S. Elshani, X.B. Xia, C.M. Wai, N.R. Natale, R.K. Widener, R.A. Bartsch, "Preparation of New Proton Ionizable and Neutral Macrocyclic, Macrobicyclic, and microtricyclic Compounds", *J. Heterocyclic Chem.*, 35, 1381-1387 (1998).
137. Yuehe Lin, Hong Wu, N.G. Smart, and C.M. Wai, "Investigation of Adducts of Lanthanide and Uranium β -Diketonates with Organophosphorus Lewis Bases by Supercritical Fluid Chromatography", *J. Chromatography A*, 793, 107-113 (1998).
138. Toby E. Young, Scott T. Ecker, Robert E. Synovec, Nathan T. Hawley, Jonathan P. Lomber, Chien M. Wai, "Bonded Stationary Phases for Reversed Phase Liquid Chromatography with a Water Mobil Phase: Application to Subcritical Water Extraction", *Talanta*, 45, 1189-1199 (1998).
139. R.S. Addleman, J. Bennett, S.H. Tweedy, S. Elshani, C.M. Wai, "Response of a Benzoxainone Derivative Linked to Monoaza-15-crown-5 with Divalent heavy Metals", *Talanta*, 46, 573-581 (1998).
140. R. Shane Addleman, C.M. Wai, "Luminescence Quenching of $\text{UO}_2(\text{NO}_3)_2 \cdot 2\text{TBP}$ in Supercritical Fluid CO_2 ", *Phys. Chem. Chem. Phys.*, 1, 783-790 (1999).
141. Hwa-Kwang Yak, Bernd Wenclawiak, Frank Cheng, John Dole, Chien M. Wai, "Reductive Dechlorination of Polychlorinated Biphenyls by Zero-Valent Iron in Subcritical Water", *Environ. Sci. Technol.*, 33, 1307-1310 (1999).
142. Qingyong Lang and C.M. Wai, "An Extraction Method for Determination of Ginkgolides and Bilobalide in Ginkgo Leaf Extracts", *Anal. Chem.*, 71, 2929-2933 (1999).
143. Amman, D.C. Hinz, R.S. Addleman, C.M. Wai, B.W. Wenclawick, "Superheated Water Extraction, Steam Distillation and SFE of Peppermint Oil", *Fresenius J. Anal. Chem.*, 364, 650-653 (1999).
144. S. Elshani, C.M. Wai, N.R. Natale, and R.A. Bartsch, "Synthesis of New Lipophilic Acyclic Di-Ionizable Polyethers - Bis(Crown Ethers) and Macrocyclic Diamides", *Tetrahedron*, 55 (31), 9425-9438 (1999).
145. M.D. Burford, M.Z. Ozel, A.A. Clifford, K.D. Bartle, Y. Lin, C.M. Wai, N.G. Smart, "Extraction and Recovery of Metals Using a Supercritical Fluid with Chelating Agents", *Analyst*, 124, 609-614 (1999).
146. Min Ji, Xiaoyuan Chen, Chien M. Wai, John L. Fulton, "Synthesizing and Dispersing Silver nanoparticles in a Water-in-Supercritical Carbon Dioxide Microemulsion", *J. Amer. Chem. Soc.*, 121, 2631-2632 (1999).
147. X. Chen, M. Ji, D.R. Fisher, and C.M. Wai, "Ionizable Calixarene-Crown Ethers with High Selectivity for Radium over Light Alkaline Earth Metal Ions", *Inorg. Chem.*, 38, 5449-5452 (1999).

148. X. Chen and C.M. Wai, "Monofunctionalization of Calix[4]arene Tetracarboxylic Acid at the Upper Rim with isothiocyanate Group: First Bifunctional Chelating Agent for Alpha-Emitter Ac-225", *Synlett.*, 11, 1784-1786 (1999).
149. Qingyong Lang and C.M. Wai, "An Extraction Method for Determination of Ginkgolides and Bilobalide in Ginkgo Leaf Extracts", *Anal. Chem.*, 71, 2929-2933 (1999).
150. Fred Hunt, Hiroyuki Ohde, and C.M. Wai, "A High Pressure Fiber-Optic Reactor with CCD Array UV-Vis Spectrometer for Monitoring Chemical Processes in Supercritical Fluids", *Rev. Sci. Instrum.*, 70, 4661-4667 (1999).
151. H.K. Yak, B.J. Mincher, K.H. Chiu, and C.M. Wai, "Supercritical Fluid Extraction/Gamma-Radiolysis of PCBs from Contaminated Soil", *J. Hazardous Materials*, 69, 209-216 (1999).
152. C.M. Wai, Y. Kulyako, H.K. Yak, X. Chen and S.J. Lee, "Selective Extraction of Strontium with Supercritical Fluid Carbon Dioxide", *Chem. Commun.*, 2533-2535 (1999).
153. Shaofen Wang, Chien M. Wai, Kong-Hwa Chiu, "Development on the Research of Supercritical Fluid Extraction", *Huaxue*, 57, 131-142 (1999).
154. Shaofen Wang, Chien M. Wai, "Applications of Supercritical Fluid Technology in Chemistry Research", *Huaxue Tongbao*, 50-55 (1999).
155. Chien M. Wai, Yuriy M. Kulyako, Boris F. Myasoedov, "Supercritical Carbon Dioxide Extraction of Cesium from Aqueous Solutions in the Presence of Macrocyclic and Fluorinated Compounds", *Mendeleev Commun.*, 180-181 (1999).
156. R. Shane Addleman, Mike J. Carrot, Chien M. Wai, "Determination of Solubilities of Uranium Complexes in Supercritical CO₂ by On-Line Laser Induced Fluorescence", *Anal. Chem.*, 72, 4015-4021 (2000).
157. Qingyong Lang, Fred Hunt, and Chien M. Wai, "Supercritical Fluid Extraction of Polycyclic Aromatic Hydrocarbons from White Pine (*Pinus Strobus*) Needle and Its Implications", *J. Environ. Monit.*, 2(6), 639-644 (2000).
158. Hwa K. Yak, Qingyong Lang, Chien M. Wai, "Relative Resistance of Positional Isomers of Polychlorinated Biphenyls toward Reductive Dechlorination by Zerovalent Iron in Subcritical Water", *Environ. Sci. Technol.*, 34, 2792-2798 (2000).
159. C.M. Wai and Shaofen Wang, "Separation of Metal Chelates and Organometallic Compounds by SFC and SFE/GC", *J. Biochem. Biophys. Methods*, 43, 273-293 (2000).
160. Chien M. Wai and Brenda Waller, "Dissolution of Metal Species in Supercritical Fluids – Principles and Applications", *Ind. Eng. Chem. Res.*, 39, 3837-3841 (2000).
161. Qingyong Lang and Chien M. Wai, "Supercritical Fluid Extraction in Herbal and Natural Product Studies – A Practical Review", *Talanta*, 53, 771-782 (2000).
162. Sadik Elshani, Hongshan Du, Kenneth Laintz, N.R. Natale, Chien Wai, Nazar Elkarim, R.A. Bartsch, "Lariat Ether Carboxylic Acids, O-Benzylhydroxamates and Hydroxamic Acids with fluorinated Substituents: Synthesis, metal Ion Complexation and Solubility in Supercritical Carbon Dioxide", *Tetrahedron*, 56, 4651-4657 (2000).

163. Yuehe Lin, Hong Wu, N.G. Smart, R.J. Staples, C.M. Wai, "Separation of Divalent Transition Metal β -Diketones and Their Adducts by Supercritical Fluid Chromatography", *Talanta*, 52, 695-701 (2000).
164. Dirk C. Hinz, Chien M. Wai, Bernd W. Wenclawiak, "Remediation of a Nonachloro Biphenyl Congener with Zero-Valent Iron in Subcritical Water", *J. Environ. Monit.*, 2, 45-48 (2000).
165. Dirk C. Hinz, Chien M. Wai, Bernd W. Wenclawiak, "Kinetic Studies of Remediation of Nonachloro Biphenyl with Zero-Valent Iron in Subcritical Water", *J. Environ. Monit.*, 0, 1-4 (2000).
166. Hiroyuki Ohde, Jose M. Rodriguez, Xiang-Rong Ye and Chien M. Wai, "Synthesizing Silver Halide Nanoparticles in Supercritical Carbon Dioxide Utilizing a Water-in-CO₂ Microemulsion", *Chem. Commun.*, 2353-2354 (2000).
167. Hiroyuki Ohde, Fred Hunt, Sorin Kihara, Chien M. Wai, "Voltammetric Measurement in Supercritical CO₂ Utilizing a Water-in-CO₂ Microemulsion", *Anal. Chem.*, 72, 4738-4741(2000).
168. R. Shane Addleman, Chien M. Wai, "On-Line Time-Resolved Laser-Induced Fluorescence of UO₂(NO₃)₂·2TBP in Supercritical Fluid CO₂", *Anal. Chem.* 72, 2109-2116 (2000).
169. M.D. Samsonov, C.M. Wai, Su-Chen Lee, Yuri Kulyako, N.G. Smart, "Dissolution of Uranium Dioxide in Supercritical Fluid Carbon Dioxide", *Chem. Commun.*, 1868-1869 (2001).
170. Hiroyuki Ohde, Fred Hunt, Chien M. Wai, "Synthesis of Silver and Copper Nanoparticles in a Water-in-Supercritical Carbon Dioxide Microemulsion", *Chem. Mater.*, 13, 4130-4135 (2001).
171. A.T. Clifford, S. Zhu, N.G. Smart, Y. Lin, Chien M. Wai, Z. Yoshida, Y. Meguro, S. Iso, "modelling of the Extraction of Uranium with Supercritical Carbon Dioxide", *J. Nucl. Sci. Technol.* 38, 433-438 (2001).
172. T.I. Trofimov, M.D. Samsonov, S.C. Lee, N.G. Smart, C.M. Wai, "Ultrasound Enhancement of dissolution Kinetics of Uranium Oxides in Supercritical Fluid Carbon Dioxide", *J. Chem. Technol. Biotechnol.*, 76, 1223-1226 (2001).
173. R. Crawford, A. Paszczynske, Q. Lang, F.I. Cheng, B. Barnes, T.J. Anderson, R. Wells, C.M. Wai, G. Corti, I. Allenbach, D.P. Erwin, J. Park, T. Assefi, M. Mojarradi, "Defining and Measuring the Chemical Signature of Life" *Icarus*, 154, 531-539 (2001).
174. M.D. Samsonov, T.I. Trofimov, S.C. Lee, B.F. Myasoedov, C.M. Wai, "Uranium Oxides Dissolution in Supercritical Carbon Dioxide Containing Tri-n-butyl Phosphate and Thenoyltrifluoroacetone", *Mendeleev Commun.*, 11(4), 129-130 (2001).
175. Sadik Elshani, Neil G. Smart, Yuehe Lin, Chien M. Wai, "Application of Supercritical Fluids to the Reactive Extraction and Analysis of Toxic Heavy Metals from Environmental Matrices-System Optimization", *Separation Science and Technology*, 36, 1197-1201 (2001).
176. Yuehe Lin, N.G. Smart, Chien M. Wai, "On-Line Recovery of Metals from Supercritical Fluid Extraction", *Separation Science and Technology*, 36, 1149-1162 (2001).

177. R. Shane Addleman, Mike J. Carrott, Chien M. Wai, Tom E. Carleson, Bernd W. Wenclawiak, "On-Line Speciation of Uranyl Chelates in Supercritical CO₂ by Time-Resolved Laser-Induced Fluorescence Spectroscopy", *Anal. Chem.*, **73**, 1112-1119 (2001).
178. Chien M. Wai and Hiroyuki Ohde, "Synthesizing Nanoparticles in Supercritical Fluids", *J. Chin. Inst. Chem. Engrs.*, **32**(3), 253-261 (2001).
179. R. Shane Addleman, Chien M. Wai, "Distribution Coefficients of UO₂(NO₃)₂·2TBP in Supercritical Fluid CO₂ as Determined by On-Line Time Resolved Laser Induced Fluorescence", *Radiochim. Acta*, **89**, 27-33 (2001).
180. Qingyong Lang, Hwa Kwang Yak, Chien M. Wai, "Selective Dissolution and One Step Separation of Terpene Trilactones in Ginkgo Leaf Extracts for GC-FID Determination", *Talanta*, **54**, 673-680 (2001).
181. Shaofen Wang, C.M. Wai, "Separation of Metal Chelates and Organometallic Compounds by Supercritical Fluid Chromatography", *Fenxi Huaxue*, **29**(6), 725-730 (2001).
182. J. Shaofen Wang, Chien M. Wai, "Chemical Reactions in Supercritical Carbon Dioxide", *Yingyong Huaxue*, **18**(2), 87-91 (2001).
183. Mariko Ohde, Hiroyuki Ohde, Chien M. Wai, "Catalytic Hydrogenation of Arenes with Rhodium Nanoparticles in a Water-in-Supercritical CO₂ Microemulsion", *Chem. Commun.*, 2388-2389 (2002).
184. Mari Manila, Hakwon Kim, Carl Isaacson, Chien M. Wai, "Optimization of Supercritical Fluid Extraction for Separation of Hyperforin and Adhyperforin in St. John's Wort (*hypericum perforatum L.*)", *Green Chemistry*, **4**, 331-336 (2002).
185. Hiroyuki Ohde, Chien M. Wai, Hakwon Kim, Jeongryul Kim, Mariko Ohde, "Hydrogenation of Olefins in Supercritical CO₂ Catalyzed by Palladium Nanoparticles in a Water-in-CO₂ Microemulsion", *J. Amer. Chem. Soc.*, **124**, 4540-4541 (2002).
186. Youichi Enokida, Samir Abd El-Fatah, Chien M. Wai, "Ultrasound Enhanced Dissolution of UO₂ in Supercritical CO₂ Containing a CO₂-Philic TBP-HNO₃ Complexant", *Ind. Eng. Chem. Res.*, **41**, 2282-2286 (2002).
187. Hiroyuki Ohde, Mariko Ohde, Hakwon Kim, Chien M. Wai, "Synthesis of CdS and ZnS Semiconductor Nanoparticles in Supercritical Carbon Dioxide Utilizing a Water-in-CO₂ Microemulsion", *Nano Letters*, **2**, 271-274 (2002).
188. Q. Lang, I.F. Cheng, C.M. Wai, A. Paszczynski, R.L. Crawford, B. Barnes, T.J. Anderson, R. Wells, G. Corti, L. Allenbach, D.P. Erwin, T. Assefi, M. Mojarradi, "Supercritical Fluid Extraction and High-Performance Liquid chromatography-Diode Array-Electrochemical Detection of Signature Redox Compounds from Sand and Soil Samples", *Anal. Biochem.*, **301**, 225-234 (2002).
189. R.L. Crawford, A. Paszczynski, Q. Lang, D.P. Erwin, L. Allenbach, G. Corti, T.J. Anderson, I.F. Cheng, C.M. Wai, B. Barnes, R. Wells, T. Assefi, M. Mojarradi, "Measurement of Microbial Activity in Soil by Colorimetric Observation of *in situ* Dye Reduction: An Approach to Detection of Extraterrestrial Life", *BMC Microbiology*, **2**:22 (2002).
190. M.D. Samsonov, T.I. Trofimov, S.E. Vinokurov, S.C. Lee, B.F. Myasoedov, C.M. Wai, "Dissolution of Actinide Oxides in Supercritical Fluid Carbon Dioxide

- Containing Various Organic Ligands”, *J. Nucl. Sci. Technol.*, Suppl. 3, 263-266 (2002).
191. Yuehe Lin, C. Liu, H. Wu, H.K Yak, Chien M. Wai, “Supercritical Fluid Extraction of Toxic Heavy Metals and Uranium from Acidic Solutions with Sulfur-Containing Organophosphorus Reagents”, *Ind. Eng. Chem. Res.* 42, 1400-1405 (2003).
 192. Qingyong Lang, Chien M. Wai, “Pressurized Water Extraction of Terpene Trilactones from Ginkgo Biloba Leaves”, *Green Chemistry*, 5, 415-420 (2003).
 193. Mari Manila, Chien M. Wai, “Pressurized Water Extraction of Naphthodianthrone in St. John’s Wort (*Hypericum Perforatum L.*)”, *Green Chemistry*, 5, 387-391 (2003).
 194. Shaofen Wang, Yuehe Lin, Chien M. Wai, “Supercritical Fluid Extraction of Toxic Heavy Metals from Solid and Aqueous Matrixes”, *Sept. Sci. Technol.* 38, 2279-2289 (2003).
 195. Sadik Elshani, Hong-Sik Hwang, Chien M. Wai, Jean’ne M. Shreeve, Richard A. Bartsch, “Synthesis of Macrocyclic Polyethers with Partially Fluorinated Side Arms”, *J. Heterocyclic Chem.*, 40, 451-458 (2003).
 196. Xiang R. Ye, Yuehe Lin, Chien M. Wai, “Decorating Catalytic Palladium Nanoparticles on Carbon Nanotubes in Supercritical Carbon Dioxide”, *Chem. Commun.* 642-643 (2003).
 197. Xiang-Rong Ye, Yuehe Lin, Chongmin Wang, Chien M. Wai, “Supercritical Fluid Fabrication of Metal Nanowires and Nanorods Templated by Multi-Walled Carbon Nanotubes”, *Adv. Mater.* 15, 316-319 (2003).
 198. Xiang-Rong Ye, Chien M. Wai, “Making Nanomaterials in Supercritical Fluids – A Review”, *J. Chem. Edu.*, 80, 198-203 (2003).
 199. Xiang R. Ye, Chien M. Wai, D. Zhang, Y. Kranov, D.N. McIlroy, Yuehe Lin, M. Engelhard, “Immersion Deposition of Metal Films on Semiconductor Surface in Supercritical Fluid Carbon Dioxide”, *Chem. Mater.*, 15, 83-91 (2003).
 200. Byunghoon Yoon, H. Kim, Chien M. Wai, “Dispersing Palladium Nanoparticles Using a Water-in-Oil Microemulsion – Homogenization of Heterogeneous Catalysis”, *Chem. Commun.* 1040-1041 (2003).
 201. Anne Rustenholtz, John L. Fulton, Chien M. Wai, “An FT-IR Study of Crown Ether-Water Complexation in Supercritical CO₂”, *J. Phys. Chem. A*, 107, 11239-11244 (2003).
 202. Alena Kubatova, Jamie Herman, Tamara S. Steckler, Marleen de Veij, David J. Miller, Chien M. Wai, Steven B. Hawthorne, “Dechlorination of PCB-Contaminated Paint Using Subcritical Water and Metal Additives”, *Environ. Sci. Technol.*, 37, 5757-5762 (2003).
 203. Yuichi Enokida, Osamu Tomioka, Su-Chen Lee, Anne Rustenholta, Chien M. Wai, “Characterization of Tri-n-butylphosphate-Nitric Acid Complex – A CO₂-Soluble Extractant for Dissolution of UO₂”, *Ind. Eng. Chem. Res.*, 42, 5037-5041 (2003).
 204. Kong-Hwa Chu, Hwa-Kwang Yak, Shaofen Wang, Chien M. Wai, “Supercritical Carbon Dioxide extraction of Mixed Wastes”, *Green Chem.* 6, 502-506 (2004).

205. Hiroyuki Ode, Mariko Ode, Chien M. Wai, "Swelled Plastics in Supercritical CO₂ as Media for Stabilization of Metal Nanoparticles and for Catalytic hydrogenation", *Chem. Commun.*, 930-931 (2004).
206. Shaofen Wang, M. Koh, C.M. Wai, "Nuclear Laundry Using Supercritical Fluid Solutions", *Ind. Eng. Chem. Res.*, 43, 1580-1585 (2004).
207. Han-Wen Cheng, Anne Rustenholtz, Richard A. Porter, Xiang R. Ye, Chien M. Wai, "Partition Coefficients and Equilibrium Constants of Crown Ethers Between Water and Organic Solvents Determined by Proton Nuclear Magnetic Resonance", *J. Chem. Eng. Data*, 49, 594-598 (2004).
208. Heidi Roy, Chien M. Wai, Tao Yuan, Jun-Kyoung Kim, William D. Marshall, "Catalytic Hydrodechlorinations of Chlorophenols in Aqueous Solution Under Mild Conditions", *Applied Catalysis, A: Chemical*, 271, 137-143 (2004).
209. Qingyong Lang, Chien M. Wai, Catharina Y.W. Ang, Yanyan Cui, Thomas M. Heinze, Antonia Mattia, Michael Dinovi, "Sample Preparations and LC-ELSD Determination of Ginkgo Terpene Trilactones in Dietary Supplements and Functional Foods", *Journal of AOAC INTERNATIONAL*, 87, 815-826 (2004).
210. Xiang-Rong Ye, Hai-Feng Zhang, Yuehe Lin, Lai-Sheng Wang, Chien M. Wai, "Modification of SiO₂ Nanowires with Metallic Nanocrystals from Supercritical CO₂", *J. Nanosci. Nanotech.*, 4, 82-85 (2004).
211. Xiang-Rong Ye, Yuehe Lin, Chongming Wang, Mark H. Engelhard, Yong Wang, Chien M. Wai, "Supercritical Fluid Synthesis and Characterization of Catalytic Metal Nanoparticles on Carbon Nanotubes", *J. Mater. Chem.*, 14, 908-913 (2004).
212. Robert V. Fox, R. Duane Ball, Peter de B. Harrington, Harry W. Rollins, John J. Jolley, Chien M. Wai, "Praseodymium Nitrate and Neodymium Nitrate Complexation with Organophosphorus Reagents in Supercritical Carbon Dioxide Solvent" *Journal of Supercritical Fluids*, 31, 273-286 (2004).
213. Joanna S. Wang, Chien M. Wai, "Arsenic in Drinking Water-A Global Environmental Problem", *J. Chem. Edu.*, 81(2), 207-213 (2004).
214. H. Ohde, S.J. Kramer, S. Moore, C.M. Wai "Low Temperature Deposition of Conformal Copper Films in Supercritical CO₂ by Catalytic Hydrogen Reduction of Copper Hexafluoroacetylacetonate", *Chem. Mater.* 16, 4028-4031 (2004).
215. Kong-Hwa Chu, Hwa-Kwang Yak, Chien M. Wai, Qingyong Lang, "Dry Ice-Originated Supercritical and Liquid Carbon Dioxide Extraction of Organic Pollutants from Environmental Samples", *Talanta*, 65, 149-154 (2005).
216. Xiang-Rong Ye, Yuehe Lin, Chien M. Wai, "Supercritical Fluid Immersion Deposition: A New Process for Selective Deposition of Metal Films on Silicon Wafer". *Surface & Coating Technol.*, 190, 25-31 (2005).
217. Mariko Ohde, Hiroyuki Ohde, Chien M. Wai, "Recycling Nanoparticles Stabilized in Water-in-CO₂ Microemulsions for Catalytic Hydrogenations", *Langmuir*, 21, 1738-1744 (2005).
218. Joanna Shaofen Wang, Chien M. Wai, "Dissolution of Precious Metals in Supercritical Carbon Dioxide", *Ind. Eng. Chem. Res.*, 44, 922-926 (2005).
219. Soufiane Mekki, Chien M. Wai, Isabelle Billard, Gilles Moutiers, Clive H. Yen, Joanna S. Wang, Ali Ouadi, Clotilde Gaillard and Peter Hesemann, "Cu(II)

- extraction by supercritical fluid carbon dioxide from a room temperature ionic liquid using fluorinated β -diketones”, *Green Chemistry*, 7, 421-423 (2005).
220. Sadik Elshani, Chien M. Wai, Jean’ne M. Shreeve, Robin D. Rogers, Richard A. Bartsch, “Synthesis of Proton-Ionizable Acyclic, Macrocyclic and Macrobicyclic Compounds Containing One or Two Triazole Groups”, *J. Heterocyclic Chem.*, 42, 621-629 (2005).
 221. Xiang-Rong Ye, Yuehe Lin, Chien M. Wai, Jan B. Talbot, Sungho Jin, “Supercritical Fluid Attachment of Palladium Nanoparticles on Aligned Carbon Nanotubes”, *J. Nanosci. Nanotech.*, 5, 964-969 (2005).
 222. Joanna Shaofen Wang, Jamie Herman, Youichi Enokida, Chien M. Wai, “Dissolution of Organic Acids in Supercritical CO₂ Using a CO₂-Soluble Lewis Base Carrier”, *J. Supercritical Fluids*, 36, 98-105 (2005).
 223. Clive H. Yen, Xiaoli Cui, Horng-Bin Pan, Shaofen Wang, Yuehe Lin, Chien M. Wai, “Deposition of Platinum Nanoparticles on Carbon Nanotubes by Supercritical Fluid Method”, *J. Nanosci. Nanotech.*, 5, 1852-1857 (2005).
 224. Yuehe Lin, Xiaoli Cui, Clive Yen, Chien M. Wai, “Platinum/Carbon Nanotube Nanocomposite Synthesized in Supercritical Fluid as Electrocatalysts for Low-Temperature Fuel Cells”, *J. Phys. Chem. B*, 109, 14410-14415 (2005).
 225. Yuehe Lin, Xiaoli Cui, Clive Yen, Chien M. Wai, “PtRu/Carbon Nanotube Nanocomposite Synthesized in Supercritical Fluid: A Novel Electrocatalyst for Direct Methanol Fuel Cell”, *Langmuir*, 21, 11474-11479 (2005).
 226. Byunghoon Yoon, Chien M. Wai, “Microemulsion-templated Synthesis of Carbon Nanotube-supported Pd and Rh Nanoparticles for Catalytic Applications” *J. Amer. Chem. Soc.* 127(49), 17174-17175 (2005).
 227. Fox, Robert V.; Ball, R. Duane; Harrington, Peter de B.; Rollins, Harry W.; Wai, Chien M.. Holmium Nitrate Complexation with Tri-n-butyl Phosphate in Supercritical Carbon Dioxide. *J. Supercr. Fluids* 36(2), 137-144 (2005).
 228. Soufiane Mekki, Chien M. Wai, Isabelle Billard, Gilles Moutiers, Byunghoon Yoon, Ali Ouadi, Clotilde Gaillard and Peter Hesemann, “Extraction of Lanthanides from Aqueous Solutions by Using Room Temperature Ionic Liquid and Supercritical Carbon Dioxide in Conjunction”, *Europ. J. Chem.* 12, 1760-1766 (2006).
 229. Carlos Fernandez, Chien M. Wai, “A Simple and Rapid Method of Making 2D and 3D Arrays of Gold Nanoparticles”, *J. Nanosci. Nanotech.* 6, 669-674 (2006).
 230. Byunghoon Yoon, Clive Yen, Soufiane Mekki, Scot Wherland, Chien M. Wai, “Effect of Water on the Heck Reactions Catalyzed by Recyclable Palladium Chloride in Ionic Liquids Coupled with Supercritical CO₂ Extraction”, *Ind. Eng. Chem. Res.*, 45, 4433-4435 (2006).
 231. Horng-Bin Pan, Clive H. Yen, Byunghoon Yoon, Masaki Sato, Chien M. Wai, “Recyclable and Ligandless Suzuki Coupling Catalyzed by Carbon Nanotube-Supported Palladium Nanoparticles Synthesized in Supercritical Fluid”, *Syn. Commun.*, 36, 3473-3478 (2006).
 232. Joanna S. Wang, Horng-Bin Pan, Chien M. Wai, “An Inorganic Route of Depositing Metal Nanoparticles on Carbon Nanotubes via a Water-in-CO₂ Microemulsion at Room Temperature”, *J. Nanosci. Nanotech.*, 6, 2025-2030 (2006).

233. DeLyle Eastwood, Carlos Fernandez, Byunghoon, Chrystal N. Sheaff, Chien M. Wai, "Fluorescence of Aromatic Amines and Their Fluorescamine Derivatives for Detection of Explosive Vapors", *Appl. Spectrosc.*, 60(9), 958-963 (2006).
234. Carlos Fernandez, Chien M. Wai, "Continuous Tuning of Silver Nanoparticle Size in a Water-in-CO₂ Microemulsion", *Small*, 2, 1266-1269 (2006).
235. Hiroyuki Ohde, C. M. Wai, Jose M. Rodriguez, "The Synthesis of Polyacrylamide Nanoparticles in Supercritical Carbon Dioxide", *Colloid and Polymer Science*, 285, 475-478 (2007).
236. Chrystal N. Sheaff, DeLyle Eastwood, Chien M. Wai, "Increasing Selectivity for TNT-Based Explosive Detection by Synchronous Luminescence and Derivative Spectroscopy with Quantum Yields of Selected Aromatic Amines", *Appl. Spectrosc.*, 61, 68-73 (2007).
237. Joanna S. Wang, Chien M. Wai, "Transporting Metal Ions Using Reverse Micelles in Alcohol Modified Supercritical Carbon Dioxide", *J. Supercr. Fluids*, 40, 176-182 (2007).
238. Byunghoon Yoon, Chrystal N. Sheaff, DeLyle Eastwood, Chien M. Wai, "Fluorescence Measurement of Benzene to Cyclohexane Conversion Catalyzed by Carbon Nanotube-supported Platinum Nanoparticles", *Journal of Nanophotonics*, 1, 013508 (2007).
239. Carlos Fernandez and Chien M. Wai, "Continuous Tuning of CdS and ZnS Nanoparticle Size in a Water-in-Supercritical Carbon Dioxide Microemulsion", *Europ. J. Chem.* 13, 5838-5844 (2007).
240. Clive H. Yen, Kenichi Shimizu, Ying-ying Lin, Franklin Bailey, I. Frances Cheng, Chien M. Wai, "Chemical Fluid Deposition of Pt-based Bimetallic Nanoparticles on Multi-walled Carbon Nanotubes for Direct Methanol Fuel Cell Application", *Energy & Fuels*, 21, 2268-2271 (2007).
241. Wei-Sheng Liao, Yun-Chieh Chen, Joanna S. Wang, Hwa Kwang Yak, Chien M. Wai, "Hydrodechlorination of Chlorinated Biphenyls in Supercritical CO₂ Catalyzed by Polymer-stabilized Palladium Nanoparticles", *Ind. Eng. Chem. Res.*, 46, 5089-5093 (2007).
242. Alexander B. Smetana, Joanna S. Wang, John Boeckl, Gail Brown, Chien M. Wai, "Fine Tuning Size of Gold Nanoparticles by Cooling During Reverse Micelle Synthesis", *Langmuir*, 23, 10429-10432 (2007).
243. Ying-ying Lin, Guodong Liu, C.M. Wai, Yuehe Lin, "Magnetic Beads-based Bioelectrochemical Immunoassay of Polycyclic Aromatic Hydrocarbons", *Electrochem. Commun.* 9, 1547-1552 (2007).
244. Joanna S. Wang, Chien M. Wai, Kenichi Shimizu, I. Frances Cheng, John Boeckl, Benji Maruyama, Gail Brown, "Purification of Single-walled Carbon Nanotubes Using a Supercritical Fluid Extraction Method", *J. Phys. Chem. C*, 111 (35), 13007-13012 (2007).
245. Guodong Liu, Ying-ying Lin, Jun Wang, Hong Wu, Chien M. Wai, Yuehe Lin, "Disposable Electrochemical Immunosensor Diagnosis Device Based on nanoparticle Probe and Immunochromatographic Strip", *Anal. Chem.*, 79(20), 7644-7653 (2007).
246. Alexander B. Smetana, Joanna S. Wang, John Boeckl, Gail Brown, Chien M. Wai, "Deposition of Ordered Arrays of Gold and Platinum Nanoparticles with

- Adjustable Particle Size and Interparticle Spacing Using Supercritical CO₂”, *J. Phys. Chem. C*, 112, 2294-2297 (2008).
247. Ying-ying Lin, Guodong Liu, C.M. Wai, Yuehe Lin, “Bioelectrochemical Immunoassay of Polychlorinated Biphenyl”, *Anal. Chim. Acta*, 612, 23-28 (2008).
 248. Guoxin Tian, Weisheng Liao, Chien M. Wai, Linfeng Rao, “Extraction of Trivalent Lanthanides with Oxa-Diamides in Supercritical Fluid Carbon Dioxide”, *Ind. Eng. Chem. Res.*, 47, 2803-2807 (2008).
 249. Kenichi Shimizu, I. Francis Cheng, Joanna S. Wang, Clive H. Yen, Byunghoon Yoon, Chien M. Wai, “Water-in-supercritical CO₂ Microemulsion for Synthesis of Carbon Nanotube-supported Pt electrocatalyst for Oxygen Reduction Reaction”, *Energy & Fuels*, 22, 2543-2549 (2008).
 250. Ying-Ying Lin, Jun Wang, Guodong Liu, Hong Wu, C. M. Wai, Yuehe Lin, “A Nanoparticle Label/immunochromatographic Electrochemical Biosensor for Rapid and Sensitive Detection of Prostate-specific Antigen”, *Biosensors & Bioelectronics*, 23, 1659-1665 (2008).
 251. Chrystal Sheaff, DeLyle Eastwood, Chien M. Wai, R. Shane Addleman, “Fluorescence Detection and Identification of Tagging Agents and Impurities in Nitro Explosives”, *Appl. Spectrosc.*, 62, 739-744 (2008).
 252. Weisheng Liao, Yukitoshi Takeshita, Chien M. Wai, “Supercritical Fluid Extraction and On-line Hydrodechlorination of Chlorinated Biphenyls Catalyzed by Polymer-stabilized Palladium Nanoparticles”, *Applied Catalysis B: Environmental*, ASAP, September 26, 2008.
 253. Joanna S. Wang, Chrystal N. Sheaff, Byunghoon Yoon, R. Shane Addleman, Chien M. Wai, “Extraction of Uranium from Aqueous Solutions Using Ionic Liquid and Supercritical Carbon Dioxide in Conjunction”, *Chem. Eur. J.*, accepted for publication, October 2008.
 254. Kenichi Shimizu, Joanna S. Wang, I. Frank Cheng, Chien M. Wai, “Rapid and One Step Synthesis of Pt/SWNT Using As-Grown Single-Walled Carbon Nanotubes Through Reduction by Methanol”, *Energy & Fuels*, ASAP January 16, 2009.
 255. Byunghoon Yoon, Horng-bin Pan, Chien M. Wai, “Relative Catalytic Activities of Carbon Nanotube-Supported Metallic Nanoparticles for Room Temperature Hydrogenation of Benzene”, *J. Phys. Chem. C*, 113, 1520-1525 (2009).
 256. Edison Shieh, Andrzej Paszczynski, Chien M. Wai, Qingyong Lang, and Ronald L. Crawford, “Sterilization of *Bacillus pumilus* Spores using Supercritical Fluid Carbon Dioxide Containing Various Modifier Solutions”, *Journal of Microbiological Methods*, 76, 247-252 (2009).

Books Edited and Book Chapters

- Z. Alfassi, C. M. Wai, Editors, *Preconcentration Techniques for Trace Elements*, CRC Press, Boca Raton, FL., 1991, 461 pages.
- C. M. Wai, "Preconcentration of Trace Elements by Solvent Extraction", in *Preconcentration Techniques for Trace Elements*, Z. Alfassi, C.M. Wai Eds., CRC Press, 1991, Chapter 4, p. 101-132.

- W. M. Mok and C. M. Wai, "Mobilization of Arsenic in Contaminated River Waters," Book Chapter in *Arsenic in the Environment, Part I: Cycling and Characterization*, J. O. Nriagu, Ed., John Wiley & Sons, Inc., 1994, p. 99-117.
- M.K. Beklemishev, C.M. Wai, "Liquid Extraction, New Extraction Agents - Crown Ether Extractants", in *Separation Techniques in Nuclear Waste Management*, T.E. Carleson, N. Chapman, C.M. Wai Eds., CRC Press, Boca Raton, FL., 1995, Chapter 3, p. 47-67
- T. E. Carleson, N. Chapman, C. M. Wai, Editors, *Separation Techniques in Nuclear Waste Management*, CRC Press, Boca Raton, FL., December, 1995, 352 pages.
- C. M. Wai, "Metal Extraction with Supercritical Fluids", in *Emerging Separation Technologies for Metals II*, R. G. Bautista, Ed., TMS, the Minerals, Metals & Materials Society, Warrendale, PA., **1996**, p. 233-248.
- C.M. Wai, Yuehe Lin, Min Ji, K.L. Toews, N.G. Smart, "Extraction and Separation of Uranium and Lanthanides with Supercritical Fluids", in "Progress in Metal Ion Separation and Preconcentration", Bond, A.H.; Dietz, M.L.; Rogers, R.D. Eds; ACS symposium Series 716, Chapter 23, p. 390-400, ACS, Washington, DC, 1999.
- Chien M. Wai, "Supercritical Fluid Extraction Technology for Nuclear Waste Management", Chapter 5.1 in *Hazardous and Radioactive Waste Treatment Technologies Handbook*, Ed. C.H. Oh, CRC Press, Boca Raton, Florida, **2001**, p. 5.1.3-20.
- Chien M. Wai, "Metal Processing in Supercritical Carbon Dioxide", Book Chapter in *Supercritical Fluid Technology in Materials Science and Engineering: Synthesis, Properties, and Applications*, Ed. Y.P. Sun, Marcel Dekker, New York, NY, **2002**, p. 351-386.
- Chien M. Wai, Shaofen Wang, M.H. Yang, "Arsenic Contamination of Groundwater, Blackfoot Disease and Other Related Health Problems", Chapter 16 in *Biochemistry of Environmentally Important Trace Element*, Y. Cai, O.C. Braids Eds., ACS Symposium Series 835, American Chemical Society, Washington, D.C. **2002**, p.210-231.
- ACS Symposium Series 860 "Separations and Processes Using Supercritical Carbon Dioxide", Editors: A.S. Gopalan, C.M. Wai., H.K. Jacobs, published in September 2003. This book has 5 chapters from Wai. Chapter 1. "An Introduction to Separation and Processes Using Supercritical Carbon Dioxide", Chien M. Wai, A.S. Gopalan, H.K Jacobs; Chapter 2. "Extraction of Uranium and Lanthanides from Their Oxides with a High Pressure Mixture of TBP-HNO₃-H₂O-CO₂", Youichi Enokida, Ichiro Yamato, Chien M. Wai; Chapter 9. "Supercritical Fluid Extraction of Bioactive Components from St.John's Wort (*Hypericum Perforatum* L.) and Ginkgo Biloba", Mari Mannila, Qingyong Lang, Chien M. Wai, Yanyan Cui, Catharina Ang; Chapter 13 "TRLIF Characterization of uranium Complexes and Processes in ScF CO₂", R. Shane Addleman, Chien M. Wai; Chapter 27 "Hydrogenation Reactions in Supercritical CO₂ Catalyzed by Metal Nanoparticles in a Water-in-CO₂ Microemulsion", Mariko Ohde, Hiroyuki Ohde, Chien M. Wai

- Yuehe Lin, Xiang-Rong Ye, Chien M. Wai, “Nanostructural Materials: Synthesized in Supercritical Fluid and Templated by Carbon Nanotubes and Nanowires”, Book Chapter in *Encyclopedia of Nanoscience and Nanotechnology*, Marcel Dekker Inc., Editors, A. Schwarz, C. Contescu, K. Putye, pp. 2595-2607 Marcel Dekker Inc., New York, (2004).
- Ang, Catharina Y. W.; Jhoo, Jin-Woo; Cui, Yanyan; Hu, Lihong; Heinze, Thomas M.; Lang, Qingyong; Wai, Chien M.; Mihalov, Jeremy J.; DiNovi, Michael; Mattia, Antonia. “Challenges in assessing bioactive botanical ingredients in functional beverages”, *ACS Symposium Series 925 “Herbs: Challenges in Chemistry and Biology”*, Eds. M. Wang, S. Sang, L.S. Hwang, C.T. Ho, American Chemical Society, Washington, DC, Chapter 5, p. 55-72 (2006).
- Chien M. Wai “Reprocessing Spent Nuclear Fuel with Supercritical Carbon Dioxide”, in *ACS Symposium Series 933, Separation for the Nuclear Fuel Cycle in the 21st Century*, Eds. G.J. Lumetta, K.L. Nash, S.B. Clark, J.E. Friese, American Chemical Society, Washington D.C., Chapter 4, p. 57-67 (2006).
- Chien M. Wai, “Supercritical Fluid Extraction of Radionuclides – A Green Technology for Nuclear Waste Management”, in *ACS Symposium Series 943, Nuclear Waste Management: Accomplishments of the Environmental Management Science Program*, Eds. P.W. Wang, T. Zachry, American Chemical Society, Washington, D.C., Chapter 9, (2006).

Patents

- "Extraction of Trace Metals from Fly Ash", U.S. Patent No. 4,475,933 (1984).
- "Hydroxamic Acid Crown Ethers", U.S. Patent No. 5,274,129 (1993).
- "Methods and Devices for the Separation of Radioactive Rare Earth Metal Isotopes", U.S. Patent No. 5,225,173 (1993).
- C.M. Wai, "Supercritical Fluid Extraction", U.S. Patent No. 5,356,538 (1994).
- "Extraction Meals Directly From Metal Oxides", U.S. Patent No. 5,606,724 (1997).
- "Extraction Of Metals Using Supercritical Fluids And Chelate Forming Ligand", U.S. Patent No. 5,730,874 (1998).
- "Extraction of Metals And/Or Metalloids From Acidic Media Using Supercritical Fluids And Salts", U.S. Patent No. 5,770,085 (1998).
- "Fluid Extraction Using Carbon Dioxide and Organophosphorus Chelating Agents", U.S. Patent No. 5,840,193 (1998).
- "Fluid Extraction", U.S. Patent No. 5,965,025 (1999).
- “Ion Binding Compounds, Radionuclide Complexes, Methods of Making Radionuclide Complexes, Methods of Extracting Radionuclides, and Methods of Delivering Radionuclides to Target Locations”, U.S. Patent No. 6,075,130 (2000).
- "Radionuclide-Binding Compound, a Radionuclide Delivery System, a Method of Making a Radium Complexing Compound, a Method of Extracting a Radionuclide, and a Method of Delivering a Radionuclide", U.S. Patent No. 6,117,413 (2000).
- "Method and Apparatus for Dissociating Metals from Metal Compounds Extracted into Supercritical Fluids", U.S. Patent No. 6,132,491 (2000).

- “Methods for Separating Metal Chelates from Other Materials Based on Solubilities in Supercritical Fluids”, U.S. Patent No. 6,187,911 (2001).
- “Pressurized Water Extraction”, U.S. Patent No. 6,524,628 (2003).
- “Methods of Forming Metal-containing Films over Surfaces of Semiconductor Substrates; and Semiconductor Constructions”, U.S. patent number 6,653,236 (2003).
- “Methods of Forming Metal-containing Films over Surfaces of Semiconductor Substrates”, U.S. patent number 7,341,947 (2008).
- Wai, Chien M.; Koegler, Sydney S. **Method and system for recovering metal from metal-containing materials.** PCT Int. Appl. (2007), 80pp. CODEN: PIXXD2 WO 2007084116 A2 20070726 CAN 147:198784 AN 2007:817496 CAPLUS

Graduate Student Training

Major Professor for 32 Ph.D. students and over 30 M.S. students at the University of Idaho (1970-present)

Grants (Current and Pending)

Carbon Nanotube-Supported Catalytic Nanoparticles for Fuel Cell Applications, Electricity Innovation Institute and Electric Power Research Institute, \$100,000 (2004-2005), \$117,000 (2006-2008) P.I.-C.M. Wai; Co-P.I.-Frank Cheng

“Advanced Materials Deposition Using Supercritical Fluids”, Air Force Office of Scientific Research (AFOSR), \$868,800 June 1, 2006 – July 31, 2008. P.I.- C.M. Wai.

“Advanced Environmental Extraction Studies for Uranium and Supercritical Fluids”, Battelle PNNL, \$249,921, August 1, 2006 – September 30, 2008. P.I. – C.M. Wai

“Synthesizing Semiconductor Nanoparticles in Supercritical Fluids”, DOE-EPSCoR, \$50,000 per year, 2006-2008.

“Advanced Materials Deposition for Semiconductor Nanostructures Using Supercritical Fluids”, DURIE-Air Force Research Lab. \$776,250 March 2008-March 2010, P.I. – C.M. Wai