CLEMENT R. YONKER

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Specialties: Physical-Analytical Chemistry

Education: B.S. Chemistry (1976), Illinois State University
Ph.D. Analytical Chemistry (1982), Stationary Phase Formation For Chemically Modified Chromatographic Supports,
University of Arizona, Professor Michael F. Burke
Post-Doctoral Fellowship, (1982-1983), University of Utah,
Professor J. Calvin Giddings
Post-Doctoral Fellowship Battelle, (1983-1984), Pacific Northwest National Laboratory, Dr. Richard D. Smith

Professional Experience Staff Scientist, Supercritical Fluids Group,
Environmental and Health Sciences Division, Battelle, Pacific Northwest National Laboratories.

My current research areas of interest involve understanding the fundamental physicochemical interactions involved in solvation and chromatographic separations processes. I have been actively involved in capillary electrophoresis, supercritical fluid chromatography, the study of the photophysics of solvation and solvent cluster formation in supercritical fluids, the photolysis of organometallic compounds in supercritical fluids, metal chelation chemistry in supercritical fluids, and high pressure chemistry and physics in liquids and supercritical fluids.

Affiliations & Activities: American Chemical Society, ACS Division of Analytical Chemistry, Association for the Advancement of Science,
Served as Secretary for the local ACS Section from 1988-1990 in Richland, Washington.

Honors & Awards: 1989 - Battelle, Pacific Northwest Laboratory
"Director's Award for Excellence"

1994 - Named Adjunct Professor of Chemistry at the University of Idaho

1998 – Key Contributor Award

Patents

5,469,061 Spectrometer Capillary Vessel and Method of Making Same, 11/21/95

5,863,290 Method For Sizing and Desizing Yarns with Liquid and Supercritical Carbon Dioxide Solvent, 1/26/99

PUBLICATIONS

These are some of the most recent publication of Dr. Yonker.

L.E. Bowman, B.J. Palmer, B.C. Garrett, J.L. Fulton, C.R. Yonker, D.M. Pfund, and S.L. Wallen. 1996. "An Infrared and Molecular Dynamics Study of D_2O Rotational Relaxation in Supercritical CO_2 and Xe," *J. Phys. Chem.*, **100**, 18327-18334.

C.R. Yonker, J.C. Linehan, and J.L. Fulton. 1999. "UV, EPR, X-ray and Related Spectroscopic Techniques," in: Chemical Synthesis Using Supercritical Fluids, P.G. Jessop and W. Leitner, Editors, Wiley-VCH, New York, 195-209.

M.M. Hoffmann, J.G. Darab, S.M. Heald, C.R. Yonker, and J.L. Fulton. 2000. "New Experimental Developments for in situ XAFS Studies of Chemical Reactions under Hydrothermal Conditions," *Chemical Geology*, in press.

C.R. Yonker, S.L. Wallen, and J.C. Linehan. 1995. "High Pressure NMR Study of Metal Complexes in Supercritical Fluids," *J. Supercritical Fluids*, **8**, 250-254.

C.R. Yonker, and S.L. Wallen. 1996. "High-Pressure On-Line Photolysis With NMR Detection," *Appl. Spectrosc.*, **50**, 781-784.

S.L. Wallen, D.M. Pfund, J.L. Fulton, C.R. Yonker, M. Newville, and Y. Ma. 1996. "High-Pressure, Capillary X-Ray Absorption Fine Structure Cell for Studies of Liquid and Supercritical Fluid Solutions," *Rev. Sci. Instrum.*, **67**, 2843-2845.

J.C. Linehan, S.L. Wallen, C.R. Yonker, T.A. Bitterwolf, J.T. Bays. 1997. "*In Situ NMR* Observations of the Photolysis of Cymantrene and Methylcymantrene in Supercritical Fluids: A New Technique Using High-Pressure NMR," *J. Am. Chem. Soc.*, **119**, 10170-10177.

C.R. Yonker, S.L. Wallen, J.C. Linehan. 1998. "Reaction Chemistries in Supercritical Fluid Solutions," *J. Microcol. Sep.*, **10**, 153-160.

J.C. Linehan, C.R. Yonker, J.T. Bays, S.T. Autrey, T.A. Bitterwolf, S. Gallagher. 1998. "A Kinetic Study of the Thermal Loss of Ethylene from $CpNb(CO)_3(\eta^2\text{-}C_2H_4)$ in Supercritical Fluid Solvents," *J. Am. Chem. Soc.*, **120**, 5826-5827.

D.M. Pfund, T.S. Zemanian, J.C. Linehan, J.L. Fulton, and C.R. Yonker. 1994. "Fluid Structure in Supercritical Xenon by Nuclear Magnetic Resonance Spectroscopy and Small Angle X-ray Scattering," *J. Phys. Chem.*, **98**, 11846-11857.

C.R. Yonker, T.S. Zemanian, J.C. Linehan, and J.A. Franz. 1995. "A New Apparatus for the Convenient Measurement of NMR Spectra in High Pressure Liquids," *J. Magn. Reson.A*, **113**, 102-107.

S.L. Wallen, B.J. Palmer, B.C. Garrett, and C.R. Yonker. 1996. "Density and Temperature Effects on the Hydrogen Bond Structure of Liquid Methanol," *J. Phys. Chem.*, **100**, 3959-3964.

S.L. Wallen, C.R. Yonker, C.L. Phelps, and C.M. Wai. 1997. "Effect of Fluorine Substitution, Pressure, and Temperature on the Tautomeric Equilibria of Acetylacetonate β-diketones," *J. Chem. Soc., Faraday Trans.*, **93**, 2391-2394.

C.R. Yonker, S.L. Wallen, B.J. Palmer, and B.C. Garrett. 1997. "Pressure and Temperature Effects on the Dynamics of Liquid *Tert*-Butanol," *J. Phys. Chem.*A, **101**, 9564-9570.

S. Bai, and C. R. Yonker. 1998. "Pressure and Temperature Effects on the Hydrogen-Bond Structures of Liquid and Supercritical Fluid Methanol," *J. Phys. Chem.*A, **102**, 8641-8647.

C.R. Yonker, J.C. Linehan, and J.L. Fulton. 1998. "The Use of High Pressure NMR for the Determination of Phase Behavior for Select Binary Solvent Systems," *J. Supercritical Fluids*, **14**, 9-16.

S. Bai, B. J. Palmer and C. R. Yonker. 1999. "Kinetics of Deuterium Exchange on Resorcinol in D_2O at High Pressure and High Temperature," *J. Phys. Chem.*A, **104**, 53-58.

C.R. Yonker. 1999. "Solution Dynamics of Perfluorobenzene, Benzene, and Perdeuterobenzene in Carbon Dioxide as a Function of Pressure and Temperature," *J. Phys. Chem.*A, **104**, 685-691.

C.R. Yonker and M. M. Hoffmann. 1999. "NMR Investigation of High Pressure, High Temperature Chemistry and Fluid Dynamics," in: *Supercritical Fluid Technology in Materials Science and Engineering*, Y-P. Sun, Editor, Marcel Dekker,Inc., New York, accepted for publication.

R.A. Wind, S. Bai, J.Z. Hu, M.S. Solum, P.D. Ellis, D.M. Grant, R.J. Pugmire, C.M.V. Taylor and C.R. Yonker. 2000. "^{1}H Dynamic Nuclear Polarization in Supercritical Ethylene at 1.4T," *J. Magn. Reson.*, **143**, 233-239.