

STEVEN R. GOATES

EDUCATION:

B.S. with University Honors, Summa cum Laude, Brigham Young University, Provo, Utah, 1976–Chemistry

M.S., The University of Michigan, Ann Arbor, Michigan, 1977–Chemistry

Ph.D., The University of Michigan, Ann Arbor, Michigan, 1981–Chemistry

PROFESSIONAL EXPERIENCE:

Brigham Young University, Provo, Utah
Associate Department Chair, 2004–2011

Chair, Analytical Area, 1993–1997

Professor of Chemistry, 1995–present

Associate Professor of Chemistry, 1987–1995

Assistant Professor of Chemistry, 1982–1987

National Institute of Standards and Technology, Gaithersburg, Maryland
Visiting Research Scientist, 2014

Oxford University, United Kingdom
Visiting Academic, 1997

Massachusetts Institute of Technology, Cambridge, Massachusetts
Visiting Scientist, 1989

Columbia University, New York City
Post-doctoral Research Associate, Columbia Radiation Laboratory, 1981–1982

RESEARCH FOCUS:

High resolution analysis of complex samples.

Spectroscopic investigations of chromatographic processes.

HONORS and AWARDS:

Karl G. Maeser Excellence in Teaching Award, Brigham Young University, 2015

General Education Professorship, Brigham Young University, 2011–2015

Joseph K. Nicholes University Citizenship Award, Department of Chemistry & Biochemistry, BYU, 2007

Recognition Award for Outstanding Teaching, College of Physical and Mathematical Sciences, BYU, 1997

Excellence in Teaching Award, Student Alumni Assoc., BYU, 1991–1992 & 1992–1993

Fajans Award for outstanding doctoral dissertation for 1981–1983, The University of Michigan, 1984

PROFESSIONAL SOCIETIES and AFFILIATIONS:

Editorial Board ISRN Chromatography, 2011–2014

Society for Applied Spectroscopy

Intermountain Section Chair, 1993–1994, 2005–2006

National Governing Board Member, 2006–2008

American Chemical Society

Central Utah Section Secretary/Treasurer, 1984–1986

Utah Award Selection Committee, 1987–1993

Central Utah Section Chair, 1999–2000

American Physical Society

Sigma Xi Scientific Research Society

Awards Selection Committee, 1990–1994

Center for Advanced Supercritical Fluid Separation Technologies

Phi Kappa Phi National Honor Society

PUBLICATIONS

S.R. Goates, J.S. Bradshaw and N.F. Mangelson, "A Study of Ozone Levels in the Granite Mountain Vault", *Utah Acad. Proc.* **51**, 26 (1974).

S.R. Goates, J.S. Bradshaw and N.F. Mangelson, "Determination of Ozone in the 5-ppb to 100-ppb Range by a Modified Saltzman Technique", *Anal. Chem.* **47**, 1690–1692 (1975).

E. Rytter, S.R. Goates and G.N. Papatheodorou, "High Temperature Raman Band Contours and Vibrational Analysis of Arsenic Oxide Vapors", *J. Chem. Phys.* **69**, 3717–3722 (1978).

L.S. Bartell, S.K. Doun and S.R. Goates, "Inference of Vibrational Anharmonicity in Hot SF₆: An Electron Diffraction Study", *J. Chem. Phys.* **70**, 4585–4586 (1979).

L.S. Bartell, S.R. Goates and M.A. Kacner, "On Collisionally Enhanced Laser Pumping of Supersonic Jets of SF₆", *Chem. Phys. Lett.* **76**, 245–248 (1980).

L.S. Bartell, M.A. Kacner and S.R. Goates, "Electron Diffraction Studies of Laser-Pumped Molecules I. Characterization of System and Analysis of Data", *J. Chem. Phys.* **75**, 2730–2735 (1981).

L.S. Bartell, M.A. Kacner and S.R. Goates, "Electron Diffraction Studies of Laser-Pumped Molecules II. Collisionally Assisted Absorption by SF₆", *J. Chem. Phys.* **75**, 2736–2741 (1981).

S.R. Goates and L.S. Bartell, "Electron Diffraction Studies of Hot Molecules I. Observed and Calculated Thermal Expansions of SF₆, CF₄ and SiF₄", *J. Chem. Phys.* **77**, 1866–1873 (1982).

- S.R. Goates and L.S. Bartell, "Electron Diffraction Studies of Hot Molecules II. 'Anharmonic Shrinkage' Expansions, in SF₆, CF₄ and SiF₄", *J. Chem. Phys.* **77**, 1874–1877 (1982).
- L.S. Bartell, W. Vance and S.R. Goates, "Electron Diffraction Studies of Hot Molecules III. Stretching and Bending Anharmonicity in CF₃Cl", *J. Chem. Phys.* **80**, 3923–3926 (1984).
- S.R. Goates, J.O. Chu and G.W. Flynn, "Observation of High Vibrational Excitation in HCN Molecules Produced from 193 nm Photolysis of 1,3,5-Triazine," *J. Chem. Phys.* **81**, 4521–4525 (1984).
- J. Boerio-Goates, S.R. Goates, J.B. Ott, and J.R. Goates, "Enthalpies of Formation of Molecular Addition Compounds in Tetrachloromethane + p-Xylene, + Toluene, and + Benzene from (Solid + Liquid) Phase Equilibria", *J. Chem. Thermodynamics* **17**, 665–670 (1985).
- J.R. Goates, J. Boerio-Goates, S.R. Goates, and J.B. Ott, "(Solid + liquid) phase equilibria for N,N-dimethylacetamide + tetrachloromethane; enthalpies of formation of molecular addition compounds and enthalpies of fusion for pure components from phase equilibria", *J. Chem. Thermodynamics* **19**, 103–107 (1987).
- S.R. Goates, J. Boerio-Goates, J.R. Goates, and J.B. Ott, "Thermodynamic Stability of Solid Inermolecular Compounds," *J. Chem. Soc., Trans. Faraday Soc. 1* **83**, 1553–1558 (1987).
- Steven R. Goates, Norman A. Zabriskie, John K. Simons, and Bahram Khoobehi, "Detection of Aerosol Formation in the Effluent of a Supercritical Fluid Chromatograph", *Anal. Chem.* **59**, 2927–2930 (1987).
- Steven R. Goates, A.J. Barker, H.S. Zakharia, B. Khoobehi, and C.W. Sheen, "Direct Supersonic Expansions of Supercritical Fluids for Analysis of Polycyclic Aromatic Hydrocarbons", *Appl. Spec.* **41**, 1392–1397 (1987).
- Douglas E. Raynie, Karin E. Markides, Milton L. Lee, and Steven R. Goates, "A Back-Pressure Regulated Restrictor for Flow Control in Capillary Supercritical Fluid Chromatography", *Anal. Chem.* **61**, 1178–1181 (1989).
- John K. Simons, Chung Hang Sin, Steven Fields, Norman A. Zabriskie, Milton L. Lee, and Steven R. Goates, "Supercritical Fluid Chromatography/Supersonic Jet Spectroscopy. I. Packed Column SFC with Direct Expansion", *J. Microcol. Separations*, **1**, 200–206 (1989).
- Steven R. Goates, Chung Hang Sin, John K. Simons, Karin E. Markides and Milton L. Lee, "Supercritical Fluid Chromatography/Supersonic Jet Spectroscopy: II. Capillary Column SFC with a Sheath-Flow Nozzle", *J. Microcol. Separations* **1**, 207–211 (1989).
- Steven R. Goates and Chung Hang Sin, "Supersonic Jet Spectroscopy Coupled to Chromatography for Very High Resolution Chemical Analysis," *Appl. Spec. Rev.* **25**, 81–126 (1989) – invited review.
- Scott M. Silence, Steven R. Goates and Keith A. Nelson, "Impulsive Stimulated Scattering Study of Normal and Supercooled Liquid Triphenyl Phosphite", *Chem Phys.* **149**, 233–259 (1990).

Scott M. Silence, Steven R. Goates and Keith A. Nelson, "Impulsive Stimulated Scattering Study of the Structural Relaxation Dynamics of Liquid Triphenyl Phosphite", *J. Non-cryst. Sol.* **131–133 (Pt 1)**, 37–41 (1991).

Steven H. Page, Steven R. Goates and Milton L. Lee, "Methanol/CO₂ Phase Behavior in Supercritical Fluid Chromatography and Extraction", *J. Supercritical Fluids* **4**, 109 (1991).

Steven H. Page, Douglas E. Rainie, Steven R. Goates, Milton L. Lee, David J. Dixon, and Keith P. Johnston, "Predictability and Effect of Phase Behavior of CO₂/Propylene Carbonate in Supercritical Fluid Chromatography and Extraction", *J. Microcol. Sep.* **3**, 355 (1991).

Chung Hang Sin, Matthew R. Linford and Steven R. Goates, "Supercritical Fluid/Supersonic Jet Spectroscopy with a Sheath-Flow Nozzle", *Anal. Chem.* **64**, 233–238 (1992).

Steven H. Page, Hao Yun, Milton L. Lee and Steven R. Goates, "Rapid Method for the Determination of Phase Behavior of Fluid Mixtures Employed in Supercritical Fluid Experiments", *Anal. Chem.* **65**, 1493–1495 (1993).

Steven H. Page, Sheldon R. Sumpter, Steven R. Goates, and Milton L. Lee, "Tri-n-butylphosphate/CO₂ and Acetone/CO₂ Phase Behaviors and Utilities in Capillary Supercritical Fluid Chromatography", *J. Supercrit. Fluid* **6**, 95–101 (1993).

G. Zhang, W.G. Pitt, S.R. Goates, and N.L. Owen, "Studies on Oxidative Photodegradation of Epoxy Resins by IR-ATR Spectroscopy", *J. Appl. Polymer Sci.* **54**, 419–427 (1994).

Q. Ji, E.M. Eyring, R. van Eldik, K.B. Reddy, S.R. Goates, and M.L. Lee, "New Optical Design for Laser Flash Photolysis Studies in Supercritical Fluids", *Rev. Sci. Instrum.* **66**, 222–226 (1995).

Q. Ji, E.M. Eyring, R. van Eldik, K.P. Johnson, S.R. Goates, and M.L. Lee, "Laser Flash Photolysis Studies of Metal Carbonyls in Supercritical CO₂ and Ethane", *Phys. Chem.* **99**, 13461–13466 (1995).

S. R. Goates, D. A. Schofield, and C. D. Bain, "A Study of Nonionic Surfactants at the Air-Water Interface by Sum-Frequency Spectroscopy and Ellipsometry", *Langmuir* **15**, 1400–1409 (1999).

L. Robert Baker, Andrew W. Orton, Steven R. Goates, and Brent A. Horn, "Characterization of Carbon Dioxide Mobile Phase Density Profiles in Packed Capillary Columns by Raman Microscopy", *Appl. Spec.* **63**, 108–111 (2009).

L. Robert Baker, Marisa A. Stark, Andrew W. Orton, Brent A. Horn, and Steven R. Goates, "Density Gradients in Packed Columns Part I: Effects of Density Gradients on Analyte Retention and Separation Speed", *J. Chromatogr. A* **1216**, 5588–5593 (2009).

L. Robert Baker, Andrew W. Orton, Marisa A. Stark, and Steven R. Goates, “Density Gradients in Packed Columns Part II: Effects of Density Gradients on Separation Efficiency”, *J. Chromatogr. A* **1216**, 5594–5599 (2009).

Arthur D. Quast, Alexander D. Curtis, Brent A. Horn, Steven R. Goates, and James E. Patterson, “Role of Nonresonant Sum-Frequency Generation in the Investigation of Model Liquid Chromatography Systems”, *Anal. Chem.*, **84**, 1862–1870 (2012).

Paul M. Cropper, Steven R. Goates, Jaron C. Hansen, “A compact gas chromatograph and pre-column concentration system for enhanced in-field separation of levoglucosan and other polar organic compounds”, *J. Chromatogr. A* **1417**, 73–70 (2015).