

William E. Acree, Jr.
Professor and Chair
Analytical Chemistry



Dr. Acree received his B.S. in 1975, his M.Sc. in 1977 and his Ph.D. in 1981, all from the University of Missouri-Rolla. He was a postdoctoral fellow at the University of Kansas in 1980. After teaching at Kent State University for 6 years, he joined the UNT faculty in 1988. Dr. Acree is on the Editorial Advisory Boards of the Journal of Chemical and Engineering Data and the Journal of Chemical Thermodynamics, and is a recipient of the UNT McNair Program – Outstanding Service Award.

Dr. Acree's primary research interests include solution thermodynamics, development of linear free energy relationships to describe partitioning phenomena of analytical, environmental and biological importance, and chromatographic separations on novel liquid crystalline stationary phases. His work involves a wide range of experimental and computational methods, including spectroscopy, chromatography, polarizing light microscopy, densimetry, and principal component analysis.

Research

* Development of expressions for determining solute-solvent association constants from measured solute solubility and chromatographic retention times in binary solvent mixtures.

* Design of gas chromatographic probe methods for investigating properties of binary nematic liquid crystalline stationary phases.

* Characterization of room temperature ionic liquids using various chromatographic and spectrophotometric probe methods.

* Development of linear free energy relationships to describe solute partitioning between immiscible liquid phases.

* Development of experimental methodology for obtaining solute descriptors from measured partitioning and chromatographic retention data.

* Development of linear free energy relationships to describe properties of chemical, biological and pharmaceutical importance.

Dr. Acree's secondary research interests include photophysical properties of large, polycyclic aromatic hydrocarbons (PAHs). Efforts are underway to develop analytical methods for determining the concentrations of PAHs in the environment samples using selective fluorescence quenching agents, such as nitromethane, which is known to selectively quench the fluorescence emission of alternant PAHs.

Selected Publications

- Sprunger, Laura; Clark, Michael; Acree, William E., Jr.; Abraham, Michael H. **Characterization of Room-Temperature Ionic Liquids by the Abraham Model with Cation- and Anion-Specific Equation Coefficients.** Journal of Chemical Information and Modeling (2007), 47(3), 1123-1129.
- Gomes, Jose R. B.; Sousa, Emanuel A.; Gomes, Paula; Vale, Nuno; Goncalves, Jorge M.; Pandey, Siddharth; Acree, William E., Jr.; Ribeiro da Silva, Maria D. M. C. **Thermochemical Studies on 3-Methyl-quinoxaline-2-carboxamide-1,4-dioxide Derivatives: Enthalpies of Formation and of N-O Bond Dissociation.** Journal of Physical Chemistry B (2007), 111(8), 2075-2080.
- Mintz, Christina; Clark, Michael; Acree, William E., Jr.; Abraham, Michael H. **Enthalpy of Solvation Correlations for Gaseous Solutes Dissolved in Water and in 1-Octanol Based on the Abraham Model.** Journal of Chemical Information and Modeling (2007), 47(1), 115-121.
- Carrillo, Miranda; Corella, Monica; Wolcott, Kimberle; Bowen, Kaci R.; Acree, William E., Jr. **Solubility of Anthracene in Binary Diisopropyl Ether + Alkane Solvent Mixtures at 298.15 K.** Journal of Chemical & Engineering Data (2007), 52(1), 270-271.
- Ribeiro da Silva, Maria D. M. C.; Vieira, Monica A. A.; Givens, Chelsea; Keown, Stephanie; Acree, William E. **Experimental thermochemical study of polymethylpyrazine N,N'-dioxide derivatives.** Thermochimica Acta (2006), 450(1-2), 67-70.
- Abraham, Michael H.; Acree, William E., Jr. **Comparative analysis of solvation and selectivity in room temperature ionic liquids using the Abraham linear free energy relationship.** Green Chemistry (2006), 8(10), 906-915.
- Acree, William E., Jr.; Chickos, James S. **Phase Change Enthalpies and Entropies of Liquid Crystals.** Journal of Physical and Chemical Reference Data (2006), 35(3), 1051-1330.



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