

## **The Solution Properties of Aqueous Biphasic Systems**

J.G. Huddleston,<sup>1</sup> H.D. Willauer,<sup>1</sup> M. Li,<sup>1</sup> and R.D. Rogers<sup>1,2</sup>  
*<sup>1</sup>Center for Green Manufacturing and <sup>2</sup>Department of Chemistry  
The University of Alabama, Tuscaloosa, AL 35487 U.S.A.*

Aqueous biphasic systems (ABS) form on the admixture of polymers or a polymer and salt in aqueous solution and appear to represent viable alternatives to the use of volatile organic solvents in many applications involving partition between immiscible phases. The physico-chemical properties of these systems determine their effectiveness in particular applications. The polarity of the phases, as revealed by solvatochromic effects on polarity sensitive dyes, and the nature of the molecular forces involved in partition, as revealed by the application of Linear Solvent Energy Relationships to the description of the partition of small monofunctional organic solutes is presented. The effects of temperature on the process of phase separation and solute distribution are also discussed. Current and potential applications of ABS in solvent extraction and molecular analysis are discussed in the light of these properties.