

Volumetric and Acoustic Properties of trans-Resveratrol in Ethanol

Ismail Kul^{C,S}, Krishna Bhat and Alexis Nagengast
Chemistry and Biochemistry, Widener University, Chester, PA, U.S.A.
ikul@widener.edu

Julianne Azarewicz
Biochemistry, Widener University, Chester, PA, U.S.A.

The densities and sound velocities of trans-resveratrol in ethanol were measured as a function of temperature ranging from 288 K to 323 K (15°C to 50°C) with 5 K intervals at selected molalities. Apparent molar volumes (V_{ϕ}) and apparent molar adiabatic compressibility ($K_{\phi,s}$) were determined from the obtained experimental data. Partial molar volumes (V_m) and partial molar isentropic compressibilities ($K_{\phi,s}^0$) at infinite dilution were calculated from the corresponding data. Furthermore, the partial molar expansivity (E^0) and Hepler's constant were calculated. The parameters were interpreted in terms of solute-solvent interactions, solute-solute interactions, and structure making/breaking behavior of trans-resveratrol in ethanol. Analyses show that trans-resveratrol in ethanol solution has strong solute-solvent interactions, weak solute-solute interactions, and that trans-resveratrol behaves as a structure breaking solute.