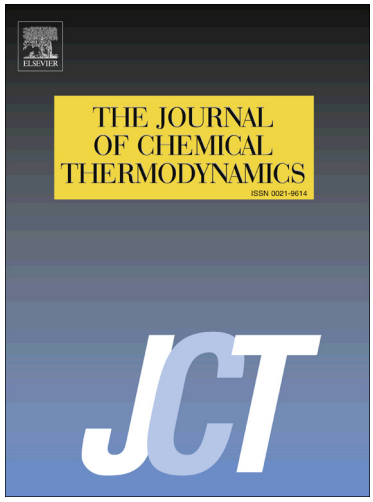

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Volumetric and compressibility behaviour of poly(propylene glycol) - Amino acid aqueous solutions at different temperatures

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Abstract

Precise density and sound velocity measurements have been carried out for aqueous solutions of PPG725 in the absence and presence of (0.2 and 0.5) mol·kg^{-1} amino acids: alanine, glycine, serine and proline, and also for aqueous solutions of these amino acids in the absence and presence of 0.01 w/w PPG725 at T = (288.15, 293.15, 298.15, 303.15 and 308.15) K. From the experimental density and sound velocity values, the apparent molar volume and isentropic compressibility have been obtained and extrapolated to infinite dilution. The infinite dilution apparent molar properties for transfer of PPG from water to aqueous amino acids solutions and also those for transfer of amino acids from water to aqueous PPG solutions have been studied. Temperature dependency of the infinite dilution apparent molar volume was utilized to determine structure-breaker or structure-maker effects of the solutes. Hydration numbers of the amino acids in the investigated aqueous solutions have been evaluated from the volumetric and compressibility properties. All results are discussed based on the salting-out aptitude of the amino acids, hydrophilic-hydrophobic interactions and hydrophobic-hydrophobic interactions occurred between PPG and the investigated amino acids.

Keywords: Volumetric; Compressibility; Poly(propylene glycol); Amino Acid; Aqueous Solutions

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