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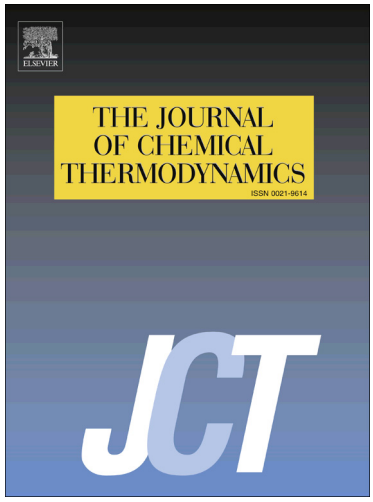

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Investigations on molecular interaction of some amino acids with the drug levofloxacin in aqueous solution by volumetric and acoustic methods at different temperatures

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ABSTRACT

Apparent molar properties ($V_\emptyset$ and $K_{\emptyset,s}$) of amino acids (glycine, L-alanine and L-valine) within the concentration range of (0.02 to 0.20) mol·kg^{-1} in aqueous (0.005, 0.01 and 0.03) mol·kg^{-1} Levofloxacin (LVFX) solutions are computed from the experimental density (ρ) and ultrasonic speed (c) values at $T =$ (288.15, 293.15, 298.15, 303.15 and 308.15) K and $P = 0.1$ MPa. Derived parameters such as partial molar properties ($V_\emptyset^0$ and $K_{\emptyset,s}^0$) and their experimental slopes (S_V and S_K), transfer partial molar properties ($\Delta V_\emptyset^0$ and $\Delta K_{\emptyset,s}^0$), hydration numbers (n_H) and Hepler's constant are computed from the data of apparent molar properties. The pair and triplet interaction coefficients have also been evaluated from transfer parameters. The linear variation of $V_\emptyset^0$ with the number of carbon atoms in the alkyl chain of amino acids has been utilized to calculate the contribution of the charged end groups (NH_3^+, COO^-), (CH_2) group and other alkyl chains of the amino acids to $V_\emptyset^0$. From the obtained parameters, some information in regard with the solute-solvent interaction in the systems studied was obtained. The co-sphere overlap model was used to interpret the positive transfer properties ($\Delta V_\emptyset^0$ and $\Delta K_{\emptyset,s}^0$). The volume and compression results suggest that there exist strong solute-solvent interactions in these systems, which increase with increase in temperature. It is inferred that amino acids studied act as structure-breaker (chaotropic effect) in aqueous LVFX solutions.

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