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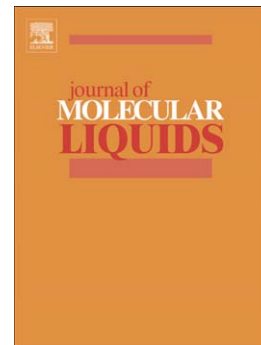
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Thermochemical characteristics of 4-OH-L-proline and L-proline dissolution in (H₂O + alcohol) mixtures at $T=298.15$ K

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Abstract

The 4-OH-L-proline and L-proline have been studied in water + alcohol (EtOH, 1-PrOH and 2-PrOH) mixtures at $T = 298.15$ K by calorimetry. The dissolution enthalpies of 4-OH-L-proline and L-proline have been determined. The standard values of dissolution enthalpies ($\Delta_{\text{sol}}H^\circ$) and transfer enthalpies ($\Delta_{\text{tr}}H^\circ$) of 4-OH-L-proline and L-proline from water to (H₂O + EtOH), (H₂O + 1-PrOH) and (H₂O + 2-PrOH) mixtures are calculated. According to the McMillan–Mayer's theory, the corresponding heterogeneous enthalpic coefficients of pairwise interaction (h_{xy}) of 4-OH-L-proline and L-proline with the alcohols molecules have been calculated. It has been found that these coefficients become increasingly positive in EtOH, 1-PrOH and 2-PrOH sequence. A comparative analysis of the enthalpic characteristics of 4-OH-L-proline and L-proline dissolution in the mixtures studied has been made. The effect of substitution of H by OH group in 4-OH-L-proline has also been studied and discussed.

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Keywords: amino acids, water, alcohols, transfer enthalpy, mixed solvent.

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