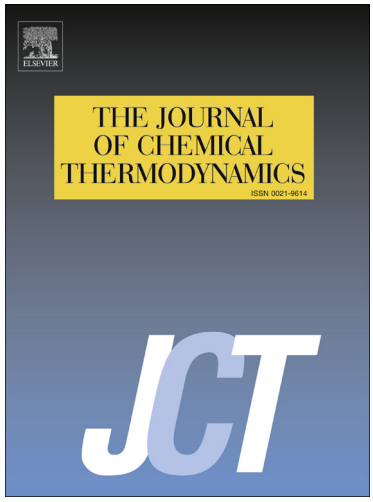

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Equilibrium solubility, dissolution thermodynamics and preferential solvation of adenosine in aqueous solutions of *N,N*-dimethylformamide, *N*-methyl-2-pyrrolidone, dimethylsulfoxide and propylene glycol

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ABSTRACT

The equilibrium solubility of adenosine in co-solvent mixtures of {(*N,N*-dimethylformamide, *N*-methyl-2-pyrrolidone, dimethylsulfoxide and propylene glycol) + water} were determined experimentally by the isothermal dissolution equilibrium method in the temperature range of (278.15 to 323.15) K under atmospheric pressure of 101.0 kPa. The maximum solubility was observed in neat *N,N*-dimethylformamide, *N*-methyl-2-pyrrolidone, dimethylsulfoxide or propylene glycol. The mole fraction solubility of adenosine increased with increasing temperature and mass fraction of co-solvent in each binary system. At the same temperature and mass fraction of the organic solvent, the solubility of adenosine was greater in (*N*-methyl-2-pyrrolidone + water) than in the other three mixed solvents. The Jouyban-Acree model, Van't Hoff-Jouyban-Acree model and Apelblat-Jouyban-Acree model were employed to correlate the measured solubility data. The largest values of relative average deviation and root-mean-square deviation were 4.87×10^{-2} and 3.52×10^{-4}, respectively. Positive values of the dissolution enthalpy illustrated that the dissolution