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Effect of temperature and solvents on thermo-physical properties of pyrimidine substituted thiazolidinone derivatives at three different temperatures

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Ultrasonic velocities, densities, and viscosities have been determined in a binary liquid tandem including pyrimidine substituted thiazolidinone at temperatures $T = (298.15, 308.15, \text{ and } 313.15 \text{ K})$ over the thiazolidinone's complete molality range. 5-(4-fluorobenzylidene)-2-(furan-2-yl)-3-(pyrimidin-2-yl)thiazolidin-4-one (**AZ₁**) and 2-(furan-2-yl)-5-(4-methylbenzylidene)-3-(pyrimidin-2-yl)thiazolidin-4-one (**AZ₂**) in *N,N*-dimethyl formamide (DMF) and dimethylsulfoxide (DMSO) were studied. Further to various acoustical and thermodynamic parameters, measurements have been made of the density, viscosity, and ultrasonic sound velocity. Further study has been conducted to figure out the effects of solvent alterations and structural modifications on the values of Gibbs energy of activation (ΔG^*), enthalpy of activation (ΔH^*), and entropy of activation (ΔS^*). These results have been explained in terms of the molecular interactions among the constituents of the liquid mixture.

Keywords: Density, Sound velocity, Gibbs energy of activation, Acoustical parameters