Measurement and Correlation of Tadalafil Solubility in Five Pure Solvents at (298.15 to 333.15) K

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Abstract:

The aim of this study was to measure and correlate the temperature dependent solubility data of tadalafil (TDL) in water, ethanol, propylene glycol (PG), polyethylene glycol-400 (PEG-400), and Transcutol from (298.15 to 333.15) K at atmospheric pressure using the shake flask method. The experimental solubilities were regressed by Apelblat equation with a relative deviation in the range of (1.20 to 5.74) % in all solvents investigated at (298.15 to 333.15) K. The root mean square deviation between experimental and calculated solubility was observed less than 1.10 in all solvents investigated. The correlation coefficients in water, ethanol, PG, PEG-400, and Transcutol were observed in the range of 0.997 to 0.999. The solubility of TDL was found to be increased with an increase in temperature in all solvents investigated. The mole fraction solubility of TDL was found to be higher in PEG-400 (1.86×10⁻² at 298.15 K) and Transcutol (8.76×10⁻³ at 298.15 K) as compared to water (5.74×10⁻⁷ at 298.15 K), ethanol (1.77×10⁻⁴ at 298.15 K) and PG (4.1×10⁻⁴ at 298.15 K).

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