

6th International Conference on

Physical and Theoretical Chemistry

September 02-03, 2019 | Zurich, Switzerland

Solubility and thermodynamic behavior of naringenin in water + methanol mixed solvent systems at temperatures between 288.15 and 328.15K

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Solid-liquid phase equilibrium solubility of naringenin in (water + methanol) binary solvent mixtures was determined by using UV spectrophotometric method from 288.15 K to 328.15 K at atmospheric pressure. The solubility of naringenin increased with increasing temperature in all tested systems. The Apelblat equation, van't Hoff equation, Jouyban-Acree model and combined Jouyban-Acree models were employed to correlate the solubility data in binary solvent mixtures. The selected thermodynamic models all can give acceptable results. Furthermore, the standard Gibbs free energy, enthalpy and entropy for the dissolution of naringenin and excess enthalpy of solution HE, were calculated, which indicates that the dissolution process of naringenin is an endothermic and entropy favorable process for their trauma needs and many without any referral to address.