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Volumetric and optical properties of ACE inhibitor captopril drug in aqueous-alcoholic mixtures

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Abstract

Captopril is an angiotensin converting enzyme (ACE) inhibitor which is used for the treatment of hypertension and congestive heart failure. The article deals with the accurate measurements of densities and refractive indices of solutions containing captopril in pure solvents like water/methanol/ethanol/1-propanol and aqueous mixtures of methanol, ethanol and propan-1-ol of 30, 50 and 70vol % in wide concentration interval of drug at 26^{o}C. It also includes the evaluation of apparent molar volume, partial molar volume at infinite dilution and transfer volumes. Concentration dependence of refractive indices studied and respective fitting parameters have been reported. Different properties are interpreted in terms of intermolecular interactions, effect of drug on structure of solvent/solvent mixture and overall structural fittings in solutions.

Keywords: Drug · Solvation · Molecular interactions· Alcohols

1. Introduction

Water-co-solvent mixtures are widely used in the pharmaceutical sciences in order to enhance the solubility of drugs. These mixtures are highly non-ideal due to existence of intermolecular interactions. The drug solutions in these water-co-solvent systems have applications in the drug solubility and design of homogeneous pharmaceutical dosage forms like syrups and