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Min Zheng, Ali Farajtabar, Hongkun Zhao



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# Solute-solvent and solvent-solvent interactions and preferential solvation of hesperidin in aqueous cosolvent mixtures of ethanol, isopropanol, propylene glycol and *n*-propanol

Min Zheng<sup>1</sup>, Ali Farajtabar<sup>2</sup>, Hongkun Zhao<sup>1,\*</sup>

<sup>1</sup> College of Chemistry & Chemical Engineering, YangZhou University, YangZhou, Jiangsu 225002, People's Republic of China

<sup>2</sup> Department of Chemistry, Jouybar Branch, Islamic Azad University, Jouybar, Iran

**Corresponding author.** Tel: + 86 514 87975568; Fax: + 86 514 87975244.

*E-mail address:* hkzhao@yzu.edu.cn (H.K. Zhao).

## ABSTRACT

Solute-solvent and solvent-solvent interactions were investigated from the available solubility data by using the linear solvation energy relationships concept. The variation of hesperidin solubility depended upon hydrogen bond basicity for ethanol (1) + water (2), hydrogen bond basicity and dipolarity/polarizability for isopropanol (1) + water (2), hydrogen bond basicity, dipolarity/polarizability and cavity term for *n*-propanol (1) + water (2), and dipolarity/polarizability and cavity term of PG (1) + water (2). Furthermore, the preferential solvation parameter ( $\delta x_{1,3}$ ) of hesperidin in four cosolvent mixtures of ethanol (1) + water (2), isopropanol (1) + water (2), propylene glycol (PG) (1) + water (2) and *n*-propanol (1) + water (2) was deduced from the solubility data with the inverse Kirkwood–Buff integrals method. In water-rich compositions for the four aqueous cosolvent mixtures, the value of  $\delta x_{1,3}$  was negative at temperatures ranging from 293.15 K to 313.15 K, which indicated that the hesperidin was preferentially solvated by water. In intermediate

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