

## 研究论文

### 苯乙烯与邻、间、对-二甲苯二元混合液的分子间相互作用

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#### 摘要:

The densities ( $\rho$ ), ultrasonic speeds ( $v$ ), and refractive indices ( $n$ ) of binary mixtures of styrene (STY) with m-, o-, or p-xylene, including those of their pure liquids, were measured over the entire composition range at the temperatures 298.15, 303.15, 308.15, and 313.15 K. The excess volumes ( $VE$ ), deviations in isentropic compressibilities ( $\Delta k_s$ ), acoustic impedances ( $\Delta Z$ ), and refractive indices ( $\Delta n$ ) were calculated from the experimental data. Partial molar volumes ( $V_{0\phi,2}$ ) and partial molar isentropic compressibilities ( $K_{0\phi,2}$ ) of xylenes in styrene have also been calculated. The derived functions, namely,  $VE$ ,  $\Delta k_s$ ,  $\Delta Z$ ,  $\Delta n$ ,  $V_{0\phi,2}$ , and  $K_{0\phi,2}$  were used to have a better understanding of the intermolecular interactions occurring between the component molecules of the present liquid mixtures. The variations of these parameters suggest that the interactions between styrene and o-, m-, or p-xylene molecules follow the sequences: p-xylene>o-xylene>m-xylene. Apart from using density data for the calculation of  $VE$ , excess molar volumes were also estimated using refractive index data. Furthermore, several refractive index mixing rules have been used to estimate the refractive indices of the studied liquid mixtures theoretically. Overall, the computed and measured data were interpreted in terms of interactions between the mixing components.

关键词: Density Ultrasonic speed Refractive indices Thermodynamic property Intermolecular interaction Binary mixture

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