

The Soret Effect in Binary Mixtures of Organic Liquids

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A temperature gradient induces mass diffusion in a multicomponent liquid mixture. Although there is no rigorous molecular theory of this so-called Soret effect, a number of systematic studies have been performed during recent years. Summarizing all these results, the Soret coefficient shows a rich variety of concentration and temperature dependencies. It can be positive or negative and may even change its sign both as a function of temperature and composition. In most cases the Soret effect becomes weaker with increasing temperature, but, depending on the system and on the concentration, the modulus of the Soret coefficient S_T may also increase with temperature. For a large number of systems, where sufficient data are available, S_T can be factorized into a concentration dependent function with a temperature dependent amplitude factor and a temperature independent fixed point at a certain concentration. We will discuss the effect of isotopic substitution and isomerization and separate kinetic and thermodynamic contributions.