Temperature Dependence of the Excess Heat Capacity for Associated Mixtures. Experimental Results and Modelling

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The excess heat capacity C_p^E of mixtures containing a self-associated liquid (e.g. an alcohol) and an inert one (e.g. an alkane) can vary with temperature in different ways. In particular, the data indicate that C_p^E can increase, decrease or exhibit extrema (a maximum at low temperatures or a minimum at high temperatures) [1]. This behavior has been rationalized using a simple statistical mechanical two-state model for association [2]. When extended to other types of mixtures, the model predicts a strikingly rich variety of $C_p^E(T)$ behaviors. Associated-associated mixtures (e.g. alcohol-alcohol) is an interesting case of study since many model predictions can be experimentally tested. This is why $C_p^E(T)$ measurements on 3-methyl-3-pentanol-1-propanol mixtures were carried out. The results are carefully analyzed and discussed. Further extensions to other cases (e.g. associated-non-inert, etc…) are also evaluated.

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[2] C.A. Cerdeiriña, J. Troncoso, D. González-Salgado, G. García-Miaja, O. Hernández-Segura, D. Bessières, M. Medeiros, L. Romaní, and M. Costas, *Chem. Phys.*, submitted