

Density Measurements for the System Ethylbenzene + Propylene Carbonate for the Temperature Range of (283.15 - 343.15) K

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Abstract

Aromatic compounds are an important class of chemicals in the petrochemical and chemical industries. Benzene, toluene, ethyl benzene, and xylenes (BTEX) are among the most important ones. Separation of these compounds from aliphatic hydrocarbons is a challenging process due to azeotrope formation and the close boiling points.

Propylene carbonate has been proven to be a good solvent for aromatic extraction. To design chemical processes, reliable property data are needed. However, the available experimental data for mixtures containing propylene carbonate exhibit inconsistencies as detected by automated consistency scanning at the Thermodynamics Research Center (NIST). Three literature sources reporting density for ethylbenzene mixed with propylene carbonate [1-3] produce highly inconsistent excess volumes. There are no reliable theoretical methods at our possession to make the judgment. A comparison with other similar mixtures suggests that the larger deviations from ideality should be erroneous. To improve the knowledge for this kind of systems and to facilitate development of prediction methods for them, new accurate measurements with a full uncertainty budget are needed.

In the present work, new accurate measurements of density for the system ethylbenzene + propylene carbonate are presented for the temperature range (283.15 – 343.15) K to resolve the inconsistencies.

References:

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