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RESEARCH PAPERS

1,2-丙二醇水溶液在不同温度下的超额摩尔体积黏度和热容

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摘要 Experimental densities, viscosities and heat capacities at different temperatures were presented over the entire mole fraction range for the binary mixture of 1,2-propanediol and water. Density values were used in the determination of excess molar volumes, VE. At the same time, the excess viscosity was investigated. The values of VE and ηE were fitted to the Redlich-Kister equation. Good agreement was observed. The excess volumes are negative
over the entire range of composition. They show an U-shaped-concentration dependence and

decrease in absolute values with increase of temperature. Values of ηE are negative over the entire range of the composition, and has a trend very similar to that of VE . The analysis shows that at any temperature the specific heat of mixture is a linear function of the composition as x1＞20%. All the extended lines intersect at one point. An empirical equation is obtained to calculate the specific heat to mixture at any composition and temperature in the experimental range.

关键词 viscosity heat capacity density excess molar volume molecular interaction

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Excess Molar Volume, Viscosity and Heat Capacity for the Mixture of 1,2-Propanediol-Water at Different Temperatures

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Abstract Experimental densities, viscosities and heat capacities at different temperatures were presented over the entire mole fraction range for the binary mixture of 1,2-propanediol and water. Density values were used in the determination of excess molar volumes, VE. At the same time, the excess viscosity was investigated. The values of VE and ηE were fitted to the Redlich-Kister equation. Good agreement was observed. The excess volumes are negative over the entire range of composition. They show an U-shaped-concentration dependence and decrease in absolute values with increase of temperature. Values of ηE are negative over the entire range of the composition, and has a trend very similar to that of VE . The analysis shows that at any temperature the specific heat of mixture is a linear function of the composition as x1＞20%. All the extended lines intersect at one point. An empirical equation is obtained to calculate the specific heat to mixture at any composition and temperature in the experimental range.

Key words viscosity; heat capacity; density; excess molar volume; molecular interaction

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