

Vapor-Liquid Equilibria of the System Nitrogen-n-Octane Between 344.5 and 543.5 K and Pressures up to 50 MPa

G. Eliosa-Jiménez

Departamento de Materiales, Universidad Autónoma Metropolitana-Azcapotzalco, México, D.F., México

G. Silva-Oliver and F. García-Sánchez^{C, S}

Laboratorio de Termodinámica PVT-AEFPT, Programa de Ingeniería Molecular, Instituto Mexicano del Petróleo, México, D.F., México
fgarcias@imp.mx

Experimental vapor-liquid equilibrium data of the N₂-n-octane system were measured over a wide temperature range from 344.5 to 543.5 K and pressures up to 50 MPa. A static-analytic apparatus with visual sapphire windows and pneumatic capillary samplers was used in the experimental measurements. Equilibrium phase compositions and vapor-liquid equilibrium ratios are reported. The degree of smoothness of the equilibrium ratio-pressure curve for each isotherm showed the internal consistency of the data. Hence, the results demonstrate the reliability of the experimental apparatus at high temperatures and pressures. The phase equilibrium measurements of the system N₂-n-octane showed that it belongs to the type III class of systems according to the classification of Konynenburg and Scott. The experimental data were modeled with the PR and PC-SAFT equations of state by using one-fluid mixing rules and a single independent-temperature interaction parameter. Results of the modeling showed that the quality for correlating the experimental vapor-liquid equilibrium data of this system with the PC-SAFT equation is superior to that obtained with the PR equation.