pVT(*x*) Property Measurements for the Liquid R1234ze(E) and Binary Mixtures of R1234ze(E) + R600a

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With an increasing demand for environmental friendly working fluids that have zero ozone depletion potential (ODP) and low global warming potential (GWP) for power systems, R1234ze(E) and its mixtures are promising working fluids in organic Rankine cycle (ORC) systems and have recently received lots of attention. Accurate *pvT*(*x*) properties of the working fluids is a prerequisite of ORC system design and optimization. The liquid phase *pvT*(*x*) property of R1234ze(E) and the binary mixtures of R1234ze(E) + R600a with compositions of (0.2 to 0.8) mole fraction R1234ze(E) were conducted using the isochoric method. The measurements were carried out in the temperature range from (255 to 293) K, and at the pressure up to 20 MPa. The isochoric measurement apparatus consists of a stainless-steel cylindrical cell of approximately 40 mL internal volume and a relative inlet duct. The internal volume of the apparatus under temperature and pressure was calibrated by measuring the liquid phase *pvT* property of R134a with a relative standard uncertainty less than 0.00056. The experimental uncertainties are estimated to be within 6.6 mK for temperatures and 15 kPa for pressures. The liquid density data of R1234ze(E) and the binary mixtures of R1234ze(E) and R600a were determined with a relative standard uncertainty less than 0.001. The present *pvT*(*x*) data of densities were compared with literature values and the equation of state.