Compressed Liquid Viscosity of Binary Mixtures of 1,1,1,2-Tetrafluoroethane (R134a) and *Trans*-1,3,3,3-Tetrafluoroprop-1-ene (R1234ze(E)) from (273 to 353) K at Pressures up to 15 MPa

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The application of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) in HVACR systems has brought great convenience to people's daily life and manufacturing, but it also causes serious environmental problems with the high ozone depletion potential (ODP) and the global warming potential (GWP). With zero ODP and low GWP (100 year GWP = 6), *Trans*-1, 3, 3,3-Tetrafluoroprop-1-ene (R1234ze(E)) is believed to be a promising alternative refrigerant[1]. However, the application of pure R1234ze(E) is limited due to the flammability and minor cooling capacity. One approach to deal with these restrictions is to use the binary mixture of R1234ze(E) with R134a, which could replace R134a directly or with minor system modifications. According to the author's knowledge, the accurate thermophysical properties of this binary mixture are extremely insufficient. In the present work, the compressed liquid viscosities of binary mixtures R134a + R1234ze(E) were measured with a vibrating wire apparatus over the temperature range from 273K to 353 K and the pressures up to 15 MPa. And the mole fraction of x_{R134a} is covered, more specifically, x_{R134a} = 0.20, 0.40, 0.60, 0.80. The combined expanded uncertainty (k = 2) of the measured viscosity is about 2.0%. Furthermore, the free-volume theory (FVT)[2] was used to correlate the experimental results. For the viscosity of mixtures, the maximum absolute relative deviations and the average absolute relative deviations between the FVT calculation and experiment are 1.73% and 0.66%, respectively.