Vapor-Liquid Equilibrium Measurements for the Binary Systems R1234ze (E) + [R125, R134a, R143a] at Temperatures from (273 to 343) K and Pressures to 4 MPa

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A new generation of refrigerants known as hydrofluoroolefins (HFOs) have much lower global warming potential (GWP) compared to traditional refrigerants. However, due to their lower coefficients of performance (COP), blending HFOs with others refrigerants such as hydrofluorocarbons (HFCs) is recommended for many industrial cycles. A lack of literature data and a need to investigate the performance of such blended mixtures, means that new thermophysical property data including the vapor-liquid equilibrium (VLE) are required for such systems. In this work, a static-analytical apparatus was used to measure new (*p,T,x,y*) data for a series of HFO+HFC binary mixtures. The systems of interest contain one of the following HFCs [R125, R134a, R143a] with R1234ze (E), an HFO. The vapor-liquid equilibrium of these systems was measured at temperatures between (273 to 343) K at 10 K intervals and with overall mole fractions of (0.2 to 0.8) for R1234ze (E). The high-pressure liquid and gas phases at equilibrium were sampled and analyzed using a GC fitted with a FID detector. The new experimental (*p,T,x,y*) data together with those available in the literature were used to tune existing models implemented in the NIST REFPROP 9.1 software to improve the predictions of VLE for these refrigerant binaries. The current work increases the confidence of the design and simulation of refrigeration processes that use HFC + HFO refrigerant mixtures.