

**Measurements of $P\rho T$ Properties, Vapor Pressures, Saturated Densities,
and Critical Parameters for R 1243zf**

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Measurements of $P\rho T$ (pressure - density - temperature) properties and vapor pressures for new low GWP refrigerant R1243zf(3,3,3-trifluoroprop-1-ene; $\text{CF}_3\text{CH}=\text{CH}_2$) were made by the isochoric method. Pressure measurements were made with the digital quartz pressure transducer and their uncertainty was estimated to be within 2 kPa. Temperature was measured with 25 Ω standard platinum resistance thermometer and AC thermometer bridge. The uncertainty of temperature measurement was estimated to be within 10 mK. The density was calculated from the sample mass and inner volume of pressure vessel. Nineteen vapor-pressure data and 133 $P\rho T$ property data for R1243zf were obtained in the temperature range from 310 K to 430 K, and pressure up to 6.9 MPa with individual seven runs. On the basis of these vapor-pressure measurements, the correlation of vapor pressures was also proposed. Saturated liquid and vapor densities were directly determined by the visual observation of meniscus disappearance. Fourteen data were obtained in the temperatures from 360.727 K to the critical temperature and in the density range between 182.7 kg/m^3 and 723.7 kg/m^3 . The critical temperature $T_c = 376.93$ K and critical density $r_c = 414$ kg/m^3 were determined taking into consideration the meniscus disappearing level and the intensity of the critical opalescence. The critical pressure $P_c = 3517$ kPa was also determined from the vapor pressure correlation made in this work.