Chapter 12, Problem 12.

Nitrogen gas at 400 K and 300 kPa behaves as an ideal gas. Estimate the c_p and c_v of the nitrogen at this state, using enthalpy and internal energy data from Table A–18, and compare them to the values listed in Table A–2*b*.

Chapter 12, Problem 16.

Verify the validity of the last Maxwell relation (Eq. 12–19) for refrigerant-134a at 80°C and 1.2 MPa.

Chapter 12, Problem 28.

Calculate the h_{fg} and s_{fg} of steam at 120°C from the Clapeyron equation, and compare them to the tabulated values.

Chapter 12, Problem 41.

Estimate the volume expansivity β and the isothermal compressibility α of refrigerant-134a at 200 kPa and 30°C.

Chapter 12, Problem 47.

Consider a gas whose equation of state is $P(\boldsymbol{v} - a) = RT$, where a is a positive constant. Is it possible to cool this gas by throttling?

Chapter 12, Problem 49.

Estimate the Joule-Thomson coefficient of steam at (*a*) 3 MPa and 300°C and (*b*) 6 MPa and 500°C.

Chapter 12, Problem 57.

Determine the enthalpy of nitrogen, in kJ/kg, at 175 K and 8 MPa using (*a*) data from the ideal-gas nitrogen table and (*b*) the generalized enthalpy departure chart. Compare your results to the actual value of 125.5 kJ/kg.

Chapter 12, Problem 59.

What is the error involved in the (*a*) enthalpy and (*b*) internal energy of CO_2 at 350 K and 10 MPa if it is assumed to be an ideal gas?

Chapter 12, Problem 62.

Methane is compressed adiabatically by a steady-flow compressor from 2 MPa and −10°C to 10 MPa and 110°C at a rate of 0.55 kg/s. Using the generalized charts, determine the required power input to the compressor.

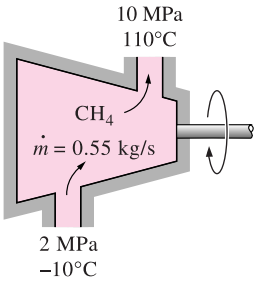

Figure P12-62