CPC Problems to be taken up before mid sem 2018

5.(9.2.17) Find the value of internal energy for water (relative to the reference state) for the states indicated:

      a. Water at 0.4 MPa, 725°C

      b. Water at 3.0 MPa, 0.01 m^3/kg

      c. Water at 1.0 MPa, 100°C

16.(9.2.32)A closed vessel contains steam at 1000.0 psia in a 4-to-1 vapor-volume-to – liquidvolumeratio. What is the steam quality?

21.(9.2.42) You have calculated that the specific enthalpy of 1 kg mol of an ideal gas at 300 kN/m^2 and 100°C is 6.05×10^5 J/kg mol (with reference to 0°C and 100 kN/m^2). What is the specific internal energy of the gas at 300kPa and 100°C?

28.(9.2.51)a. Ten pound moles of an ideal gas are originally in a tank at 100 atm and 40°F. The gasis heated to 440°F. The specific molar enthalpy of the ideal gas is given by the equation $\hat{H} = 300 + 8.00T$, where $\hat{H}$ is in British thermal units per pound mole and **T** is the temperature in degrees Fahrenheit.

      1. Compute the volume of the container (in cubic feet).

      2. Compute the final pressure of the gas (in atmospheres).

      3. Compute the enthalpy change of the gas.

b. Use the equation above to develop an equation giving the molar internal energy, in joules per gram mole as a function of temperature, T, in degrees Celsius.

44.(9.3.26) Four kilograms of superheated steam at 700 kPa and 500 K are cooled in a tank to 400 K.Calculate the heat transfer involved.