

ASSIGNMENT 3

CHEMISTRY 305

Due: 4:30 pm Monday 27 January 2010

1. Derive the following:

(a)

$$\left(\frac{\partial U}{\partial V}\right)_T = T \left(\frac{\partial p}{\partial T}\right)_V - p$$

(b)

$$\left(\frac{\partial H}{\partial P}\right)_T = V - T \left(\frac{\partial V}{\partial T}\right)_p$$

2. Evaluate the two expressions derived in question 1 for each of

(a) a perfect gas

(b) a hard-sphere gas

(c) a van der Waals gas

(d) a Berthelot gas

(e) a gas described by the virial equation.

3. Do question 26 on page 487 of your text.

4. Do question 4 on page 593 of your text.

5. Do question 6 on page 593 of your text.