

Chemistry-4311
September 16, 2011

Quiz #2

Name Ker

5 1. Matching (Use a letter only once)

The enthalpy, H, is defined as g.

Mathematically, a statement of the First Law is e.

For a constant pressure process, work is a.

If the only work is P,V work and V is constant, q equals f.

ΔH is d for protein folding.

- a. $-P_{ex}\Delta V$
- b. $U - PV$
- c. ΔH
- d. negative
- e. $\Delta U = q + w$
- f. ΔU
- g. $U + PV$
- h. $\Delta U = -nRT \ln V$
- i. positive
- j. $-nRT \ln(V_2/V_1)$

2^{1/2} 2. One mole of an ideal gas initially at a volume of 100.0 L and 300 K is compressed reversibly and isothermally until its final volume is 10.0 L. What is w for this expansion?

$$\begin{aligned} w &= -nRT \ln V_2/V_1 = -\frac{8.314 \text{ J}}{\text{K}} \times 300 \text{ K} \times \ln \frac{10}{100} \\ &= 5,743 \text{ J} = 5.74 \text{ kJ} \\ &= 56.7 \text{ L-atm} \end{aligned}$$

2^{1/2} 3. Ten grams of a compound with a specific heat capacity of $50 \text{ J g}^{-1} \text{ K}^{-1}$ is heated from 20°C to 100°C . How much heat was transferred for this process?

$$q = \frac{50 \text{ J}}{\text{g K}} \times 10 \text{ g} \times (100 - 20) \text{ K} = 40,000 \text{ J} = 40 \times 10^3 \text{ kJ}$$

$$q = c_{\text{specific}} m \Delta T$$