

Chemistry-4311
October 3, 2014

Quiz #4

Name _____

$$R = 1.987 \text{ cal K}^{-1} \text{ mol}^{-1} = 8.314 \text{ J K}^{-1} \text{ mol}^{-1} = 0.08206 \text{ L atm K}^{-1} \text{ mol}^{-1}$$
$$K = ^\circ\text{C} + 273.15$$

1. Matching (Use a letter only once)

An entropy change is defined as ___ j___.

ΔG is ___ a___ if the process is spontaneous.

According to the 2nd Law of Thermodynamics, the entropy of the universe ___ i___ for all spontaneous processes.

The Gibbs energy G is defined as ___ d___

ΔH is negative for all spontaneous processes; ___ c___.

- a. negative
- b. decreases
- c. no
- d. $G = H - TS$
- e. positive
- f. $G = U - TS$
- g. dq_{irrev}/T
- h. yes
- i. increases
- j. dq_{rev}/T

2. Select the correct equation for ΔS .

Ideal gas expansion or compression: ___ d___

Heating or cooling a pure substance without a phase change at constant P : ___ a___

A phase transition at equilibrium: ___ b___

Mixing two ideal gases: ___ e___

- a. $C_p \ln(T_2/T_1)$
- b. $\Delta H_{\text{trans}}/T_{\text{trans}}$
- c. $k_B \ln(w)$
- d. $nR \ln(V_2/V_1)$
- e. $-R(n_1 \ln x_1 + n_2 \ln x_2)$

3. Give a statement of the 3rd Law of Thermodynamics.

The entropy of a perfect crystal, at absolute zero (zero kelvins), is exactly equal to zero.