

September 21, 2012

Quiz # 3

Name: KEY

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

$$K = ^\circ\text{C} + 273.15$$

## 1. Matching

A chemical reaction that gives off heat to its surroundings is an h reaction

Entropy ( $S$ ) is a f function

Second law of thermodynamics states that Entropy of Universe a during a process

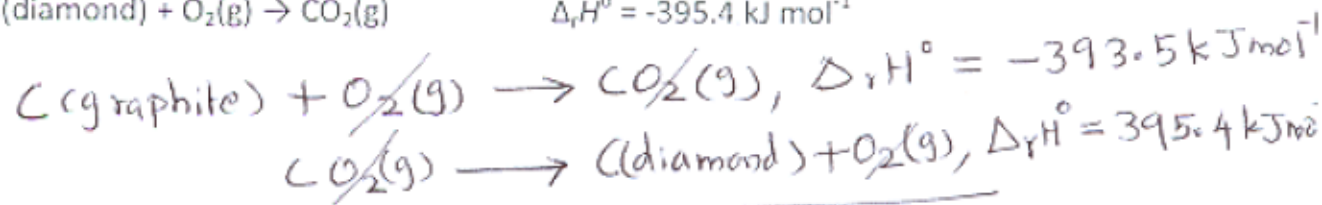
For a reversible process, Entropy change ( $\Delta S$ ) and heat ( $q_{\text{rev}}$ ) are related as b

- (a) Increases
- (b)  $\Delta S = q_{\text{rev}}/T$
- (c) Decreases
- (d) Path
- (e) Endothermic
- (f) State
- (g)  $\Delta S = T/q_{\text{rev}}$
- (h) Exothermic

## 2. The formation reaction of diamond is



Calculate the standard enthalpy of formation for diamond, using the information below



$$\Delta_r H^\circ = (+395.4 - 393.5) \text{ kJ mol}^{-1}$$

$$\Delta_r H^\circ = \underline{\underline{1.9 \text{ kJ mol}^{-1}}}$$

## 3. Calculate the entropy change when 2.0 moles of an ideal gas are allowed to expand isothermally from an initial volume of 1.5 L to 2.4 L.

$$\begin{aligned} \Delta S &= n R \ln\left(\frac{V_2}{V_1}\right) \\ &= (2.0 \text{ mol}) (8.314 \text{ J K}^{-1} \text{ mol}^{-1}) \ln\left(\frac{2.4 \text{ L}}{1.5 \text{ L}}\right) \end{aligned}$$

$$\Delta S = \underline{\underline{7.8 \text{ J K}^{-1}}}$$