CHE101 - Extra Practice - Ch 11 - F21 Score: _____/95

Name: _____ Class: _____ Date: _____

Instructions: Answer the following questions. Show ALL work for problems to receive full credit. Make sure to include proper units and significant figures for all answers.

[5 pt] 1. Answer the following questions about the reaction below. The reaction is endothermic. Assume the system is at equilibrium.

$$\_\_N_2(g) + \_3\_H_2(g) \rightleftharpoons \_2\_NH_3(g) + 92kJ$$

Complete the following table. Indicate changes in concentration of each product and reactant by entering (I)ncrease, (D)ecrease, (N)o change, or a ? for insufficient information to determine.

Stress Applied:	Direction Reaction Shifted	$[N_2]$	$[H_2]$	$[NH_3]$
Add NH_3				
Remove H_2				
Increase Pressure				
Decrease Temperature				
Increase Volume				

[10 pt] 2. Consider the following system at equilibrium:

$$125kJ + Mg(s) + \_2\_HCl(aq) \rightleftharpoons \_1\_H_2(g) + \_1\_MgCl_2(aq)$$

(a) Should you add or remove HCl to increase the production of hydrogen gas? Explain. 2(a) _____

(b) Should you increase or decrease the temperature to increase the production of hydrogen gas? Explain. 2(b) _____

(c) Should you increase or decrease the pressure to increase the production of hydrogen gas? Explain. 2(c) _____

(d) Is the reaction shown an exothermic or endothermic reaction? Explain. 2(d) _____

[20 pt] 3. Answer the following questions about the reaction below. The reaction is endothermic. Assume the system is at equilibrium.

$$525\text{kJ} + \underline{\ 2\ }\text{A(s)} + \underline{\ 3\ }\text{B(g)} \rightleftharpoons \underline{\ 6\ }\text{C(g)} + \underline{\ 2\ }\text{D(g)}$$

Complete the following table. Indicate changes in concentration of each product and reactant by entering (I)ncrease, (D)ecrease, (N)o change, or a ? for insufficient information to determine.

Stress Applied:	Direction Reaction Shifted	[2A(s)]	[3 B(g)]	[6C(g)]	[2D(g)]
Add C					
Remove B					
Increase Volume					
Increase Pressure					
Increase Temperature					
Add A					
Remove D					
Decrease Temperature					
Decrease Pressure					
Decrease Volume					
Add a Catalyst					

[20 pt] 4. Answer the following questions about the reaction below. The reaction is endothermic. Assume the system is at equilibrium.

$$2C_2H_6(s) + 7O_2(g) \rightleftharpoons 6H_2O(g) + 4CO_2(g) + 75kJ$$

Complete the following table. Indicate changes in concentration of each product and reactant by entering (I)ncrease, (D)ecrease, (N)o change, or a ? for insufficient information to determine.

Stress Applied:	Direction Reaction Shifted	$[C_2H_6]$	$[O_2]$	$[H_2O]$	$[CO_2]$
Add O_2					
Remove CO_2					
Increase Volume					
Decrease Pressure					
Increase Temperature					
Lower the Activation Energy					
Remove C_2H_6					
Add H_2O					
Decrease Volume					
Increase Pressure					
Decrease Temperature					

[20 pt] 5. Answer the following questions about the reaction below. The reaction is endothermic. Assume the system is at equilibrium.

$$\_1\_\,W(g) + \_4\_\,X(g) \rightleftharpoons \_2\_\,Y(g) + \_2\_\,Z(g) + 100.kJ$$

Complete the following table. Indicate changes in concentration of each product and reactant by entering (I)ncrease, (D)ecrease, (N)o change, or a ? for insufficient information to determine.

Stress Applied:	Direction Reaction Shifted	[W(s)]	[X(g)]	[Y(g)]	[Z(g)]
Add Z					
Add a Catalyst					
Remove X					
Increase Pressure					
Decrease Pressure					
Decrease Temperature					
Add W					
Increase Volume					
Increase Temperature					
Decrease Volume					
Remove Y					

[20 pt] 6. Answer the following questions about the reaction below. The reaction is endothermic. Assume the system is at equilibrium.

$$\_\_\_F_2(g) + \_2\_HCl(aq) \longrightarrow \_1\_Cl_2(g) + \_2\_HF(aq) + 250kJ$$

Complete the following table. Indicate changes in concentration of each product and reactant by entering (I)ncrease, (D)ecrease, (N)o change, or a ? for insufficient information to determine.

Stress Applied:	Direction Reaction Shifted	$[F_2(g)]$	$[HCl(aq)]$	$[Cl_2(g)]$	$[HF(aq)]$
Add Cl_2					
Remove HCl					
Increase Volume					
Decrease Pressure					
Increase Temperature					
RemoveF_2					
Add HCl					
Decrease Volume					
Increase Pressure					
Decrease Temperature					