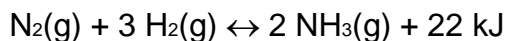


Le Chatelier's Principle Worksheet #2



- 1) In the following reaction, will the $[H_2]$ increase or decrease when equilibrium is reestablished after these stresses are applied?



$NH_3(g)$ is added _____ $N_2(g)$ is removed _____
pressure is increased _____ Temperature is increased _____

- 2) In which direction, left or right, will the equilibrium shift if the following changes are made?



NO is added _____ The system is cooled _____
 H_2 is removed _____ Pressure is increased _____
 N_2O is added _____ H_2 is removed _____

- 3) In this reaction: $CO_2(g) + H_2(g) + \text{heat} \leftrightarrow CO (g) + H_2O (g)$

Is heat absorbed or released by the forward reaction? _____

In which direction will the equilibrium shift if these changes are made?

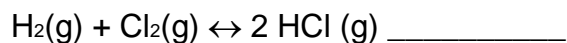
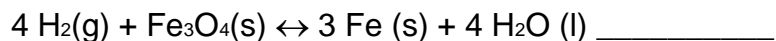
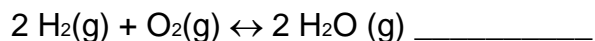
CO is added _____ Temperature is increased _____
 CO_2 is added _____ System is cooled _____
 H_2 is removed _____ Pressure is increased _____
Catalyst is added _____

- 4) In this reaction: $2 NO (g) + H_2(g) \leftrightarrow N_2O (g) + H_2O (g) + \text{heat}$

What will happen to the $[H_2O]$ when equilibrium is reestablished after these stresses are applied?

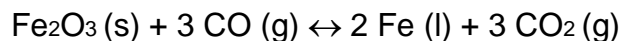
Temperature is increased _____
A catalyst is added _____
Pressure is decreased _____
NO is added _____
 N_2O is removed _____

5) How would an increase in pressure affect the $[H_2]$ in the following reactions?



6) State Le Chatelier's Principle in your own words.

7) The reaction of iron(III) oxide with carbon monoxide occurs in a blast furnace when iron ore is reduced to iron metal:



Use Le Chatelier's Principle to predict the direction of reaction when an equilibrium mixture is disturbed by :

Adding CO (g) _____ Removing CO₂ (g) _____

Adding Fe₂O₃ (s) _____

8) For the reaction, $PCl_5 (g) \leftrightarrow PCl_3 (g) + Cl_2 (g) \quad \Delta H_{rxn} = +111 \text{ kJ}$.

Fill in the following table.

Change	Shifts Reaction Which Way?
add PCl ₅	
remove Cl ₂	
add Ar	
decrease V (or increase P)	
increase T	
add catalyst	

9) For the reaction: $2HI(g) \leftrightarrow H_2(g) + I_2(g) \quad \Delta H_{rxn} = -51.8 \text{ kJ}$

Fill in the following table:

Change	Shifts Reaction Which Way?
add H ₂	
remove HI	
add Ne	
increase V (decrease P)	
decrease T	