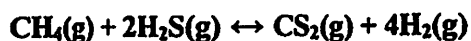


## Le Chatelier's Principle Worksheet

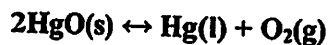
- 1) For the reaction below, which change would cause the equilibrium to shift to the right?



- (a) Decrease the concentration of dihydrogen sulfide.
  - (b) Increase the pressure on the system.
  - (c) Increase the temperature of the system.
  - (d) Increase the concentration of carbon disulfide.
  - (e) Decrease the concentration of methane.
- 2) What would happen to the position of the equilibrium when the following changes are made to the equilibrium system below?

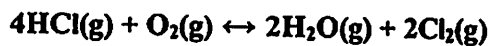


- (a) Sulfur dioxide is added to the system.
  - (b) Sulfur trioxide is removed from the system.
  - (c) Oxygen is added to the system.
- 3) What would happen to the position of the equilibrium when the following changes are made to the reaction below?

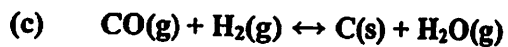
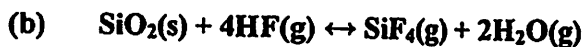
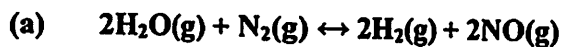


- (a) HgO is added to the system.
- (b) The pressure on the system increases.

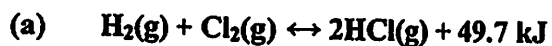
- 4) When the volume of the following mixture of gases is increased, what will be the effect on the equilibrium position?



- 5) Predict the effect of decreasing the volume of the container for each equilibrium.



- 6) Predict the effect of decreasing the temperature on the position of the following equilibria.



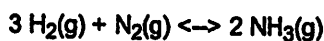
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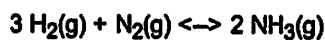
**Le Chatelier's Principle**[Show questions one by one](#)

1. When extra  $\text{NH}_3$  is added to the following system at equilibrium:



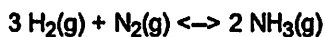
- A.  In order to restore equilibrium, the reaction shifts right, toward products
- B.  No change occurs
- C.  In order to restore equilibrium, the reaction shifts left, toward reactants

2. When  $\text{N}_2$  is removed from the following system at equilibrium:



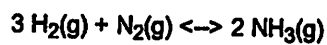
- A.  In order to restore equilibrium, the reaction shifts right, toward products
- B.  In order to restore equilibrium, the reaction shifts left, toward reactants
- C.  No change occurs

3. When  $\text{H}_2$  is added to the following system at equilibrium:



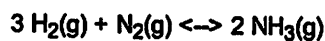
- A.  In order to restore equilibrium, the reaction shifts left, toward reactants
- B.  No change occurs
- C.  In order to restore equilibrium, the reaction shifts right, toward products

4. When the pressure is increased on the following system at equilibrium:



- A.  In order to restore equilibrium, the reaction shifts left, toward reactants
- B.  No change occurs
- C.  In order to restore equilibrium, the reaction shifts right, toward products
- 

5. When the pressure is decreased on the following system at equilibrium:



- A.  In order to restore equilibrium, the reaction shifts right, toward products
- B.  In order to restore equilibrium, the reaction shifts left, toward reactants
- C.  No change occurs
- 

6. When the temperature is decreased on the following system at equilibrium:



- A.  In order to restore equilibrium, the reaction shifts right, toward products
- B.  No change occurs
- C.  In order to restore equilibrium, the reaction shifts left, toward reactants
- 

7. When the temperature is increased on the following system at equilibrium:



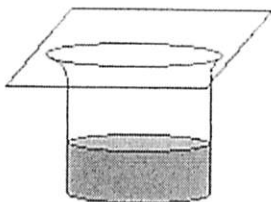
- A.  No change occurs
- B.  In order to restore equilibrium, the reaction shifts right, toward products
- C.  In order to restore equilibrium, the reaction shifts left, toward reactants
- 

8. When the temperature is decreased on the following system at equilibrium:



- A.  ? In order to restore equilibrium, the reaction shifts right, toward products
- B.  ? In order to restore equilibrium, the reaction shifts left, toward reactants
- C.  ? No change occurs

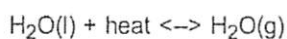
9.



The system depicted here is maintained at a temperature of 30 degrees celsius. If the temperature of the system is doubled, the system will achieve equilibrium by which of the following responses?

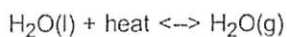
- A.  ? A higher percentage of the water will move into the vapor phase.
- B.  ? The temperature of the liquid water will exceed the temperature of the vapor.
- C.  ? The temperature of the vapor will exceed the temperature of the liquid water.
- D.  ? A higher percentage of the water vapor in the container will condense to liquid.

10. When the temperature is increased on a closed system containing water and its vapor at equilibrium:



- A.  ? No change occurs
- B.  ? In order to restore equilibrium, water vapor condenses to form liquid water
- C.  ? In order to restore equilibrium, more liquid water evaporates

11. When the temperature is decreased on a closed system containing water and its vapor at equilibrium:



- A.  ? No change occurs
- B.  ? In order to restore equilibrium, more liquid water evaporates
- C.  ? In order to restore equilibrium, water vapor condenses to form liquid water