

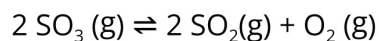
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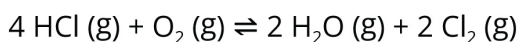
# Le Chatelier's Principle Worksheet



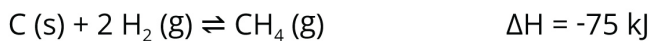
1. What would happen to the position of the equilibrium when the following changes are made to the equilibrium system below?



- (a) Sulfur dioxide is added to the system.
- (b) Sulfur trioxide is removed from the system.
- (c) Oxygen is added to the system.
2. When the volume of the following mixture of gases is increased, what will be the effect on the equilibrium position?

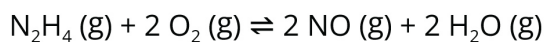


3. Consider the following equilibrium system:



State four different ways to make more C react.

4. Consider the following equilibrium:



More oxygen is added to the above equilibrium. After the system re-establishes equilibrium, identify the substance(s), if any, which have a net:

(a) Increase in concentration.

(b) Decrease in concentration.

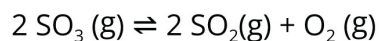
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# Le Chatelier's Principle Worksheet



1. 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.

Shifts left to counteract the increased concentration of  $\text{SO}_2 (\text{g})$ .

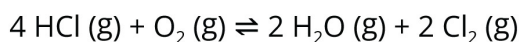
- (b) Sulfur trioxide is removed from the system.

Shifts left to counteract the decrease in concentration of  $\text{SO}_3 (\text{g})$ .

- (c) Oxygen is added to the system.

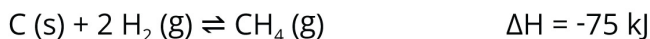
Shifts left to counteract the increase in concentration of  $\text{O}_2 (\text{g})$ .

2. When the volume of the following mixture of gases is increased, what will be the effect on the equilibrium position?



Equilibrium will shift to favor reactants.

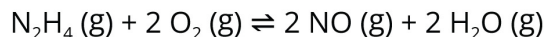
3. Consider the following equilibrium system:



State four different ways to make more C react.

Making more C react means you want to shift the equilibrium to the right; therefore, you must add  $\text{H}_2$ , remove  $\text{CH}_4$ , decrease the temperature, or increase pressure/decrease volume.

4. Consider the following equilibrium:



More oxygen is added to the above equilibrium. After the system re-establishes equilibrium, identify the substance(s), if any, which have a net:

- (a) Increase in concentration.

Increasing  $\text{O}_2$  would cause a shift right; therefore, the  $[\text{NO}]$  and  $[\text{H}_2\text{O}]$  would increase, and the  $[\text{O}_2]$  would increase immediately and then decrease during the shift. However, it would still be greater than it was before.

- (b) Decrease in concentration.

$[\text{N}_2\text{H}_4]$