

Chemistry - Equilibrium HW3 - Le Chatelier and Ksp

Name: _____ Date: _____ Per: _____

Use the following to answer questions 1-4:

Consider the reaction $2\text{H}_2(g) + \text{O}_2(g) \rightleftharpoons 2\text{H}_2\text{O}(g)$ at some equilibrium position. Using the following choices, indicate what will happen if the changes below are made.

- a. shifts to the left
- b. shifts to the right
- c. no change

1. Additional $\text{H}_2\text{O}(g)$ is injected into the reaction vessel.
2. Some $\text{H}_2(g)$ is removed from the reaction vessel.
3. The size of the reaction vessel is decreased.
4. Some $\text{He}(g)$ is injected into the reaction vessel.

Use the following to answer questions 5-9:

Consider the reaction system $\text{CH}_4(g) + 2\text{O}_2(g) \rightleftharpoons \text{CO}_2(g) + 2\text{H}_2\text{O}(g) + \text{energy}$, and use the following choices to describe what happens when the changes below are made to the system at equilibrium.

- a. shifts to the left
- b. shifts to the right
- c. no change

5. $\text{O}_2(g)$ is removed from the reaction vessel.
6. $\text{CO}_2(g)$ is removed from the reaction vessel.
7. $\text{He}(g)$ is added to the reaction vessel.
8. The temperature is increased.
9. $\text{CH}_4(g)$ is added to the reaction vessel.

Use the following to answer questions 10-12:

Given the equation $A(g) \rightleftharpoons B(g) + 2C(g)$. At a particular temperature, $K = 1.4 \times 10^5$.

10. Addition of chemical B to an equilibrium mixture of the above
- A) will cause [A] to increase
 - B) will cause [C] to increase
 - C) will have no effect
 - D) cannot be determined
 - E) none of the above
11. Placing the equilibrium mixture in an ice bath (thus lowering the temperature)
- A) will cause [A] to increase
 - B) will cause [B] to increase
 - C) will have no effect
 - D) cannot be determined
 - E) none of the above
12. Raising the pressure by decreasing the volume of the container
- A) will cause [A] to increase
 - B) will cause [B] to increase
 - C) will have no effect
 - D) cannot be determined
 - E) none of the above

13. Given the solubility products (K_{sp})

BaSO ₄	1.5×10^{-9}
CoS	5.0×10^{-22}
PbSO ₄	1.3×10^{-2}
AgBr	5.0×10^{-13}

which of the following compounds is the most soluble (in mol/L)?

- A) BaSO₄ B) CoS C) PbSO₄ D) AgBr E) BaCO₃
14. Write the balanced equation for the dissolving of Ag₂S(*s*) in water.