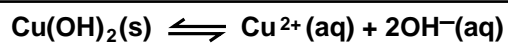


Name: _____ Date: _____

- 1 Which statement most accurately describes the state of a reaction after it has reached chemical equilibrium?
- A At chemical equilibrium, equal amounts of products and reactants are present.
- B The forward and reverse reactions are producing equal concentrations.
- C The forward and reverse reactions are occurring at equal rates.
- D At equilibrium, the reaction is continuing in either the forward or reverse direction.

Use the equation below to answer question 2.



- 2 Which of these is the correct way to express the equilibrium constant expression for the reaction above?
- A $K = [\text{Cu}^{2+}][\text{OH}^{-}]^2$
- B $K = [\text{Cu}^{2+}][\text{OH}^{-}]^2 \div [\text{Cu(OH)}_2]$
- C $K = [\text{Cu}^{2+}][\text{OH}_2^{-}]$
- D $K = [\text{Cu}^{2+}][\text{OH}_2^{-}] \div [\text{Cu(OH)}_2]$

Use the equation below to answer question 3.



- 3 The reaction above is exothermic. To produce less product, what experimental change would be most effective?
- A Decrease volume
- B Decrease the temperature
- C Increase pressure
- D Increase the temperature

Use the table below to answer question 4.

Solubility Product Constants at 298K

| Compound | K_{sp} Value |
|-------------------|-----------------------|
| PbBr ₂ | 6.6×10^{-6} |
| Ag ₂ S | 8.0×10^{-51} |
| PbCl ₂ | 1.7×10^{-5} |
| MgCO ₃ | 6.8×10^{-6} |

- 4 According to this table, which compound has the greatest solubility in pure water?
- A PbBr₂
- B Ag₂S
- C PbCl₂
- D MgCO₃

Name: _____ **Date:** _____

- 5 K_{sp} values can be compared with the ion product, Q_{sp} , to determine whether or not a precipitate will form for a given solution. How would you describe a solution of AgCl with $Q_{sp} = 1.4 \times 10^{-10}$ and $K_{sp} = 1.8 \times 10^{-10}$?
- A Supersaturated
 B Unsaturated
 C Saturated
 D Precipitated
- 6 The common ion effect alters the amount of solid that will dissociate in solution. The addition of solid silver chromate to an aqueous solution of potassium chromate will affect the silver chromate's solubility because —
- A solids are always subject to the common ion effect in solution
 B the ion chromate is common to both solutions and will decrease silver chromate's solubility
 C the combination of two common metals, silver and potassium, will decrease solubility
 D the ion chromate is common to both solutions and will increase solubility
- 7 Le Châtelier's principle demonstrates the effect of disturbances on chemical equilibrium. Le Châtelier's principle can also help predict whether or not disturbances will affect the equilibrium constant, K_{eq} . None of these will affect the equilibrium constant EXCEPT the —
- A addition of more product
 B decrease in volume
 C increase in pressure
 D increase in temperature
- 8 Use the equation below to answer question 8.
- $$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$$
- 8 Which experimental disturbance will produce more NH_3 (ammonia) in the above reaction?
- A Decrease in pressure
 B Addition of more ammonia
 C Decrease in volume
 D Addition of a catalyst

