Competitive Exams: Chemistry MCQs (Practice_Test 16 of 31)

1. Select the statement below that is correct
   a. All compounds of carbonate (CO32-) phosphate (PO43-) and sulfide (S2-) are soluble
   b. All compounds of nitrate (NO3-) and chlorate (ClO3-) are soluble
   c. All compounds of hydroxide (OH-) are soluble
   d. All compounds of the halogen ions (e. g. Cl-, Br-, I-) are insoluble
   e. No response above is correct
2. Addition of sodium bromide, a very soluble salt, to a saturated solution of silver bromide, a slightly soluble salt, would cause:
   a. the concentrations of silver ion, bromide ion and silver bromide to increase.
   b. the concentration of bromide ion to increase and the concentration of silver ion to decrease.
   c. the concentration of bromide ion to decrease and the concentration of silver ion to increase.
   d. the concentration of bromide ion to decrease and the concentration of silver bromide to increase.
3. Addition of hydrochloric acid to a saturated solution of cadmium hydroxide (Cd (OH) 2, Ksp = 2.5 × 10 − 14) in water would cause:
   a. the solubility of cadmium hydroxide to decrease.
   b. the OH-concentration to decrease and the Cd2 + concentration to increase.
   c. the concentrations of both Cd2 + and OH-to decrease.

d. the concentrations of both Cd2 + and OH-to increase.

e. no change in the solubility of Cd (OH) 2.

4. Given the following slightly soluble salts and solubility-product constants, which salt would be most soluble in pure water?

a. AgCl: Ksp = 1.8 × 10 – 10.

b. AgBr: Ksp = 5.0 × 10 – 15.

c. AgI: Ksp = 8.3 × 10 – 17.

d. AuCl: Ksp = 2.0 × 10 – 13.

5. The solubility of gold chloride (AuCl3) in pure water is 1.0 × 10 – 6 moles per liter. Calculate the solubility product constant of gold chloride in water.

a. N/A

b. N/A

c. N/A

d. N/A

6. Calculate the molar solubility of cadmium hydroxide (Cd (OH) 2) in pure water. For cadmium hydroxide, Ksp = 2.5 × 10 – 14

a. N/A

b. N/A

c. N/A

d. N/A

7. Calculate the molar solubility of cupric hydroxide (Cu (OH) 2, Ksp = 2.2 × 10 – 20) in a solution buffered at pH 8

a. N/A

b. N/A

c. N/A

d. N/A

8. Assume a solution containing 0.01 M stannous sulfide (SnS, Ksp = 1.0 × 10 – 25) and 0.01 M manganese sulfide (MnS, Ksp = 3.0 × 10 – 15) . If sulfide ion (S2-) concentration is increased gradually without dilution of the solution, what will be the molar concentration of Sn2 + ion when manganese sulfide first starts to precipitate?

a. N/A

b. N/A

c. N/A

d. N/A

9. Which of the following statements is correct?
   a. Most salts of alkali metal ions (K + , Na +) , most nitrates, most sulfides and most hydroxides are soluble in water.
   b. Most salts of alkali metal ions (K + , Na +) and most nitrates are insoluble in water and most sulfides and most hydroxides are soluble in water.
   c. Most salts of alkali metal ions (K + , Na +) and most nitrates are soluble in water and most sulfides and most hydroxides are insoluble in water.
   d. Most salts of alkali metal ions (K + , Na +) and most sulfides are insoluble in water and and most nitrates and most hydroxides are soluble in water.
   e. Most salts of alkali metal ions (K + , Na +) , most nitrates, most sulfides and most hydroxides are insoluble in water.
10. Which of the following salts is least soluble in otherwise pure water?
   a. AgCl, Ksp = $1.8 \times 10 - 10$
   b. AuCl, Ksp = $2.0 \times 10 - 13$
   c. AgI, Ksp = $8.3 \times 10 - 17$
   d. AgBr, Ksp = $5.0 \times 10 - 15$
   e. CuBr, Ksp = $5.3 \times 10 - 9$
11. Addition of silver nitrate ($AgNO3$) to a saturated solution of silver chloride (Ksp = $1.8 \times 10 - 10$) would cause:
   a. the chloride ion concentration to be larger than that in the saturated solution.
   b. the chloride ion concentration to be smaller than that in the saturated solution.
   c. the chloride ion and silver ion concentrations to be larger than that in the saturated solution.
   d. the chloride ion and silver ion concentrations to be smaller than that in the saturated solution.
   e. no change in the chloride ion concentration.
12. Addition of solid silver chloride to a saturated solution of silver chloride (Ksp = $1.8 \times 10 - 10$) would cause:
   a. the chloride ion concentration to be larger than that in the saturated solution.

b. no change in the chloride ion concentration.

c. the chloride ion and silver ion concentrations to be larger than that in the saturated solution.

d. the chloride ion and silver ion concentrations to be smaller than that in the saturated solution.

e. the chloride ion concentration to be smaller than that in the saturated solution.

13. The solubility of gold chloride (AuCl3 ⇔ Au3 ++ 3Cl-) in water is 1.04 × 10 − 6 mol/L. Calculate the value of the solubility-product constant, Ksp, for gold chloride.

14. The solubility-product constant for lead iodide (PbI2 ⇔ Pb2 ++ 2I-) is Ksp = 7.1 × 10 − 9. Calculate the molar solubility of lead iodide in otherwise pure water.

15. Calculate the molar solubility of lead iodide (PbI2 ⇔ Pb2 ++ 2I-, Ksp = 7.1 × 10 − 9) in a solution containing 0.10 M potassium iodide (KI) , a very soluble salt.

16. What mimimum hydronium ion concentration (M) would be needed to prevent precipitation of cupric hydroxide (Cu (OH) 2 ⇔ Cu2 ++ 2OH-, Ksp = 2.2 × 10 − 20) from a solution containing 0.010 M Cu2 + ion?