Teache

MULTIPLE CHOICE

1. A weak electrolyte exists predominantly as _____ in solution.
   a) atoms
   b) ions
   c) molecules
   d) electrons
   e) an isotope

2. Which of the following are weak electrolytes?
   1. HCl
   2. $HC_2H_3O_2$
   3. NH_3
   4. KCl

   a) 1 & 4
   b) 1, 2, 3, & 4
   c) 2 & 4
   d) 2 & 3
   e) 1, 2, & 4

3. What are the spectator ions in the reaction between $KOH(aq)$ and $HNO_3(aq)$?
   a) K^+ and H^+
   b) H^+ and OH^-
   c) K^+ and NO^-_3
   d) H^+ and NO^-_3
   e) OH^- only

   $H_2O + K^+ + NO_3^-$

4. Combining aqueous solutions of BaI_2 and K_2SO_4 affords a precipitate of $BaSO_4$. Which ion(s) is/are spectator ions in the reaction?
   a) Ba^{2+} only
   b) K^+ only
   c) Ba^{2+} and SO_4^{2-}
   d) K^+ and I^-
   e) SO_4^{2-} and I^-

5. Which ion(s) is/are spectator ions in the formation of a precipitate of AgBr via combining aqueous solutions of $CoBr_2$ and $AgNO_3$?
   a) Co^{2+} and NO_3^-
   b) NO_3^- and Br^-
   c) Co^{2+} and Ag^+
   d) Br^-
   e) NO_3^-

6. The balanced molecular equation for precipitation of AgI when aqueous solutions of $AgNO_3$ and NaI are mixed is _____.
   a) $AgNO_3(aq) + NaI(aq) \rightarrow AgI(s) + NaNO_3(aq)$
   b) $AgNO_3(aq) + NaI(aq) \rightarrow AgI(aq) + NaNO_3(s)$
   c) $AgNO_3(s) + NaI(s) \rightarrow AgI(aq) + NaNO_3(aq)$
   d) $AgNO_3(aq) + NaI(aq) \rightarrow AgI(s) + NaNO_3(s)$
   e) $AgNO_3(s) + NaI(s) \rightarrow AgI(s) + NaNO_3(aq)$

7. The balanced molecular equation for complete neutralization of H_2SO_4 by KOH in aqueous solution is _____.
   a) $2H^+ (aq) + 2OH^- (aq) \rightarrow 2H_2O(l)$
   b) $2H^+ (aq) + 2KOH(aq) \rightarrow 2H_2O(l) + 2K^+ (aq)$
   c) $H_2SO_4 (aq) + 2OH^- (aq) \rightarrow 2H_2O(l) + SO_4^{2-} (aq)$
   d) $H_2SO_4 (aq) + 2KOH(aq) \rightarrow 2H_2O(l) + K_2SO_4 (s)$
   e) $H_2SO_4 (aq) + 2KOH(aq) \rightarrow 2H_2O(l) + K_2SO_4 (aq)$

8. The reaction between strontium hydroxide and chloric acid produces _____.
   Strong *Strong*
   a) a molecular compound and a weak electrolyte
   b) two weak electrolytes
   c) two strong electrolytes
   d) a molecular compound and a strong electrolyte
   e) two molecular compounds

   $\rightarrow 2H_2O + Sr^+ + 2ClO_3^-$

9. Which one of the following is a diprotic acid?
   a) nitric acid
   b) chloric acid
   c) phosphoric acid
   d) hydrofluroric acid
   e) sulfuric acid

10. A compound was found to be soluble in water. It was also found that addition of acid to an aqueous solution of this compound resulted in the formation of carbon dioxide. Which one of the following cations would form a precipitate when added to an aqueous solution of this compound? *ionic ppt with CO_3^{2-}*
    a) NH^+_4
    b) K^+
    c) Cr^{3+}
    d) Rb^+
    e) Na^+

11. The balanced reaction between aqueous nitric acid and aqueous strontium hydroxide is _____.
    $HNO_3 + Sr(OH)_2$
    a) $HNO_3 (aq) + Sr(OH)_2 (aq) \rightarrow Sr(NO_3)_2 (aq) + H_2 (g)$
    b) $HNO_3 (aq) + Sr(OH)_2 (aq) \rightarrow H_2O(l) + Sr(NO_3)_2 (aq)$
    c) $HNO_3 (aq) + SrOH(aq) \rightarrow H_2O(l) + SrNO_3 (aq)$
    d) $2HNO_3 (aq) + Sr(OH)_2 (aq) \rightarrow 2H_2O(l) + Sr(NO_3)_2 (aq)$
    e) $2HNO_3 (aq) + Sr(OH)_2 (aq) \rightarrow Sr(NO_3)_2 (aq) + 2H_2 (g)$

12. One method for removal of metal ions from a solution is to convert the metal to its elemental form so it can be filtered out as a solid. Which metal can be used to remove aluminum ions from solution?
    a) zinc   *See Act. Series*
    b) cobalt
    c) lead   *See Q15*
    d) copper
    e) none of these

13. The reaction of _____ produces hydrogen gas.
    a) Cu with HNO_3
    b) Co with HCl
    c) Ag with HCl
    d) Hg with HCl
    e) Au with HNO_3

14. The net ionic equation for the dissolution of zinc metal in aqueous hydrobromic acid is _____.
    a) $Zn(s) + 2Br^- (aq) \rightarrow ZnBr_2 (aq)$
    b) $Zn(s) + 2HBr(aq) \rightarrow ZnBr_2 (aq) + 2H^+ (aq)$
    c) $Zn(s) + 2HBr(aq) \rightarrow ZnBr_2 (s) + 2H^+ (aq)$
    d) $Zn(s) + 2H^+ (aq) \rightarrow Zn^{2+} (aq) + H_2 (g)$
    e) $2Zn(s) + H^+ (aq) \rightarrow 2Zn^{2+} (aq) + H_2 (g)$

15. Zinc is more active than cobalt and iron but less active than aluminum. Cobalt is more active than nickel but less active than iron. Which of the following correctly lists the elements in order of increasing activity?

    a) Co < Ni < Fe < Zn < Al
    b) Ni < Fe < Co < Zn < Al
    c) Ni < Co < Fe < Zn < Al
    d) Fe < Ni < Co < Al < Zn
    e) Zn < Al < Co < Ni < Fe

16. What is the concentration (M) of sodium ions in 4.57 L of a 0.847 M Na_3P solution?
    a) 0.847
    b) 3.87
    c) 0.185
    d) 2.54
    e) 0.282

17. How many grams of H_3PO_4 are in 175 mL of a 3.5 M solution of H_3PO_4?
    a) 0.61
    b) 60
    c) 20
    d) 4.9
    e) 612

18. How many moles of K^+ are present in 343 mL of a 1.27 M solution of K_3PO_4?
    a) 0.436
    b) 1.31
    c) 0.145
    d) 3.70
    e) 11.1

19. Calculate the concentration (M) of sodium ions in a solution made by diluting 50.0 mL of a 0.874 M solution of sodium sulfide to a total volume of 250.0 mL.
    a) 0.175
    b) 4.37
    c) 0.525
    d) 0.350
    e) 0.874

20. What is the molarity of an aqueous solution containing 52.5 g of sucrose $(C_{12}H_{22}O_{11})$ in 35.5 mL of solution?
    a) 5.46
    b) 1.48
    c) 0.104
    d) 4.32
    e) 1.85

21. What is the molarity of a solution prepared by diluting 43.72 mL of 1.005 M aqueous $K_2Cr_2O_7$ to 500 mL?
    a) 0.0879
    b) 87.9
    c) 0.0218
    d) 0.0115
    e) 0.870

    $M_1 V_1 = M_2 V_2$

    $43.72)(1.005) = (M) 500)$

22. What is the concentration of chloride ions in a 0.193 M solution of potassium chloride?
    a) 0.0643 M
    b) 0.386 M
    c) 0.0965 M
    d) 0.579 M
    e) 0.193 M

    KCl

23. When 0.500 mol of $HC_2H_3O_2$ is combined with enough water to make a 300 mL solution, the concentration of $HC_2H_3O_2$ is _____ M.
    a) 3.33
    b) 1.67
    c) 0.835
    d) 0.00167
    e) 0.150

    $\dfrac{0.5M}{0.3}$

24. A 17.5 mL sample of an acetic acid (CH_3CO_2H) solution required 29.6 mL of 0.250 M NaOH for neutralization. The concentration of aceticacid was _____ M.
    a) 0.15
    b) 0.42
    c) 130
    d) 6.8
    e) 0.21

    $n =$ (29.6)(0.250)   1:1

    $\approx 7 mL$

    $\overline{17 mL}$

25. The point in a titration at which the indicator changes is called the _____.
    a) equivalence point
    b) indicator point
    c) standard point
    d) endpoint
    e) volumetric point