CHem.G11-Q3W3-Acids and bases reactions-H.W

Problem 1

The table shows the data collected in a series of five titration experiments between samples of nitric acid and sodium hydroxide. From the information in the table, determine the missing values.

     a. A. $1.3M$

     b. B. $0.20M$

     c. C. $0.48M$

     d. D. 20.0 mL

       E. 50.0 Ml

Experiment	Acid		Base		Answer
	molarity	volume	molarity	volume	A,B,C, or D
1	$0.10M$	40.0 mL	$0.20M$	?	
2	?	50.0 mL	$0.14M$	70.0 mL	
3	$0.40M$	30.0 mL	?	25.0 mL	
4	$0.010M$	?	$0.0077M$	65.0 mL	
5	$2.0M$	16.0 mL	?	25.0 mL	

Problem 2

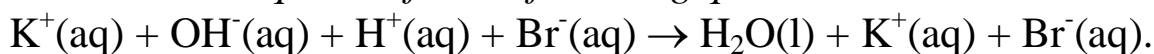*Each of the following salts is dissolved in water. Predict whether the solution formed would be acidic, basic, or neutral.*

    A. Acidic
    B. Basic
    C. Neutral
    D. cannot be determined

6. NaCN

7. LiCl

8. $(NH_4)_2SO_4$

9. K_2CO_3

10. K_2SO_4

Completion
Complete each statement.

> *Consider this equation for the following questions*:
> $K^+(aq) + OH^-(aq) + H^+(aq) + Br^-(aq) \rightarrow H_2O(l) + K^+(aq) + Br^-(aq)$.

        A. ionic equation
        B. net ionic equation
        C. standard solution
        D. buffer
        E. spectator ions
        F. titration

11. If you wanted to adjust the solution in a titration so that the pH changes very slowly, you could add a(n) _____ _____ to the reaction mixture.

12. You can tell from the equation that certain ions do not actually take part in the reaction. These ions are called _____.

13. This equation, called a(n) _____, shows what actually happens when potassium hydroxide and hydrobromic acid are combined in a water solution.

14. If a reaction were conducted in such a way as to determine the concentration of potassium hydroxide or hydrobromic acid, the process would be called a(n) _____.

15. If spectator ions are removed from the above equation, the resulting equation, called the _____, shows the only real change that takes place in the reaction.

Short Answer

16. A 25.0-mL sample of a solution of acetic acid, $HC_2H_3O_2$, is titrated to the endpoint with 232 mL of 0.100M $Ca(OH)_2$. What is the molarity of the acetic acid?

    A. 1.76M
    B. 1.86M
    C. 1.96M
    D. 2.06M

17. A 35.0-mL sample of an unknown triprotic acid is titrated to the endpoint with 168.4 mL of 0.0700M $Sr(OH)_2$. What is the molarity of the acid solution?   0.225M

    A. 0.225M
    B. 0.325M
    C. 0.425M
    D. 0.525M

18. An antacid tablet containing $NaHCO_3$ is titrated with 0.400M HCl. If 0.500 g of the tablet requires 11.8 mL of HCl to reach the endpoint, what is the mass percent of $NaHCO_3$ in the tablet?

    A. 69.3%
    B. 79.3%
    C. 89.3%
    D. 99.3%

19. Tartaric acid is often added to artificial fruit drinks to increase tartness. A sample of a certain beverage contains 0.655 g of tartaric acid, $H_2C_4H_4O_6$. The beverage is titrated with 0.250M NaOH. Assuming no other acids are present, how many milliliters of base are required to neutralize the tartaric acid?

    A. 04.9 mL
    B. 14.9 mL
    C. 24.9 mL
    D. 34.9 mL

20. A 0.800M NaOH solution was used to titrate an HCl solution of unknown concentration. At the endpoint, 17.2 mL of NaOH solution had neutralized 50.0 mL of HCl. What is the molarity of the HCl solution?

    A. 0.075M
    B. 0.175M
    C. 0.275M
    D. 0.375M

Multiple Choice
Identify the choice that best completes the statement or answers the question.

_____ 21. According to the Bronsted-Lowry definition, an acid is a substance that _____.
    a. releases H^+ in solution   c. donates hydrogen atoms
    b. donates protons   d. accepts protons

_____ 22. The effect of antacid on stomach fluids is to _____.
    a. decrease their pH   c. make them basic
    b. make them neutral   d. increase their pH

_____ 23. The reaction between an acid and a base always results in the formation of _____.
    a. a spectator ion   c. a salt
    b. a basic anhydride   d. an acid anhydride

_____ 24. The spectator ions in the reaction between HNO_3 and NH_4OH are _____.
    a. $NH_4^+ + OH^-$ c. $NH_4^+ + NO_3^-$
    b. $H^+ + OH^-$ d. $H^+ + NO_3^-$

_____ 25. In the reaction $CO_3^{2-} + H^+ \rightarrow HCO_3^-$, the base is _____.
    a. H^+ c. CO_3^{2-}
    b. HCO_3^- d. not shown

Yes/No
Indicate whether you agree with the statement.

_____ 26. HCN + KOH could be combined to form a buffer solution.

_____ 27. HNO_3 + KNO_3 could be combined to form a buffer solution.

_____ 28. NH_4OH + NH_4Cl could be combined to form a buffer solution.

_____ 29. $KC_2H_3O_2$ + $HC_2H_3O_2$ could be combined to form a buffer solution.

_____ 30. NH_4CN + HCl could be combined to form a buffer solution.

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