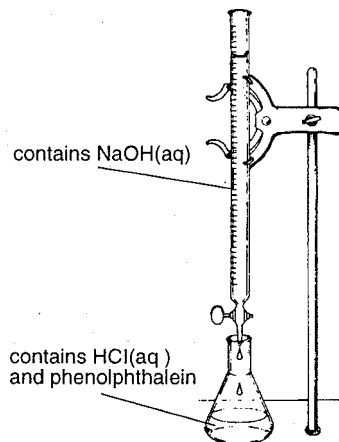


- \_\_\_\_1. Which type of reaction will produce water and a salt?  
 (A) saponification (C) esterification  
 (B) fermentation (D) neutralization
- \_\_\_\_2. Which reaction occurs when hydrogen ions react with hydroxide ions to form water?  
 (A) substitution (C) ionization  
 (B) saponification (D) neutralization
- \_\_\_\_3. Which equation represents a neutralization reaction?  
 (A)  $\text{Na}_2\text{CO}_3 + \text{CaCl}_2 \rightarrow 2 \text{NaCl} + \text{CaCO}_3$   
 (B)  $\text{Ni}(\text{NO}_3)_2 + \text{H}_2\text{S} \rightarrow \text{NiS} + 2 \text{HNO}_3$   
 (C)  $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$   
 (D)  $\text{H}_2\text{SO}_4 + \text{Mg}(\text{OH})_2 \rightarrow \text{MgSO}_4 + 2 \text{H}_2\text{O}$
- \_\_\_\_4. Which compound is a salt?  
 (A)  $\text{NaNO}_3$   
 (B)  $\text{H}_3\text{PO}_4$   
 (C)  $\text{CH}_3\text{COOH}$   
 (D)  $\text{Ca}(\text{OH})_2$
- \_\_\_\_5. What volume of 0.500 M  $\text{HNO}_3(\text{aq})$  must completely react to neutralize 100.0 milliliters of 0.100 M  $\text{KOH}(\text{aq})$ ?  
 (A) 10.0 mL (C) 50.0 mL  
 (B) 20.0 mL (D) 500. mL
- \_\_\_\_6. How many milliliters of 0.100 M  $\text{NaOH}(\text{aq})$  would be needed to completely neutralize 50.0 milliliters of 0.300 M  $\text{HCl}(\text{aq})$ ?  
 (A) 16.7 mL (C) 150. mL  
 (B) 50.0 mL (D) 300. mL
- \_\_\_\_7. Which process uses a volume of solution of known concentration to determine the concentration of another solution?  
 (A) distillation (C) transmutation  
 (B) substitution (D) titration

- \_\_\_\_8. The diagram below shows  $\text{NaOH}(\text{aq})$  being added to  $\text{HCl}(\text{aq})$ . A few drops of phenolphthalein were added to the flask before the titration was started.



The endpoint in this titration is reached when the solution in the flask appears

- (A) pink (C) blue  
 (B) colorless (D) yellow
- \_\_\_\_9. What is the molarity of an  $\text{HNO}_3$  solution if 50.0 milliliters of 0.50 M  $\text{LiOH}$  is required to exactly neutralize 100. milliliters of the  $\text{HNO}_3$  solution?  
 (A) 1.5 M (C) 0.50 M  
 (B) 2.0 M (D) 0.25 M
- \_\_\_\_10. The following data were collected at the endpoint of a titration performed to find the molarity of an  $\text{HCl}$  solution.

Volume of acid ( $\text{HCl}$ ) used = 14.4 ml  
 Volume of base ( $\text{NaOH}$ ) used = 22.4 ml  
 Molarity of standard base ( $\text{NaOH}$ ) = 0.20 M

- What is the molarity of the acid solution?  
 (A) 1.6 M (C) 0.31 M  
 (B) 0.64 M (D) 0.13 M

**Worksheet: Acid-Base Calcs II**

- \_\_\_ 11. The table below shows the color of an indicator in specific pH ranges.

Color	pH Range
Red	1-4
Orange	5-6
Green	6-7
Blue	8-10
Violet	11-14

If this indicator is used when titrating an unknown strong base by adding a strong acid, the color of the indicator will change from

- (A) blue to green                      (C) orange to green  
(B) green to blue                      (D) green to orange

- \_\_\_ 12. If 25. milliliters of 0.80 M HCl is used to completely neutralize 40. milliliters of NaOH solution, what is the molarity of the base?

- (A) 5.0 M                                  (C) 0.050 M  
(B) 0.50 M                                (D) 50. M

- \_\_\_ 13. What is the pH of a 0.0001 M aqueous solution of HCl?

- (A) 1    (C) 3  
(B) 2    (D) 4

- \_\_\_ 14. What is the pH of a 0.00001 molar HCl solution?

- (A) 1    (C) 5  
(B) 9    (D) 4

- \_\_\_ 15. What is the pOH of a 0.0001 M aqueous solution of NaOH?

- (A) 1    (C) 3  
(B) 2    (D) 4

- \_\_\_ 16. What is the pOH of a 0.0001 M aqueous solution of HCl?

- (A) 10                                        (C) 12  
(B) 11                                        (D) 13

- \_\_\_ 17. What is the pH of a 0.0001 M aqueous solution of NaOH?

- (A) 10                                        (C) 12  
(B) 11                                        (D) 13
-

**Worksheet: Acid-Base Calcs II**  
**Answer Key**

1.   D  

2.   D  

3.   D  

4.   A  

5.   B  

6.   C  

7.   D  

8.   A  

9.   D  

10.   C  

11.   A  

12.   B  

13.   D  

14.   C  

15.   D  

16.   A  

17.   A  

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