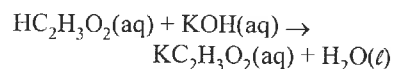


1. An aqueous solution of $\text{NaC}_2\text{H}_3\text{O}_2$ is basic. The salt $\text{NaC}_2\text{H}_3\text{O}_2$ can be derived from the reaction of a
- 1) strong acid with a strong base
 - 2) weak acid with a strong base
 - 3) weak acid with a weak base
 - 4) strong acid with a weak base

2. Potassium chloride, KCl , is a salt derived from the neutralization of a
- 1) strong acid and a weak base
 - 2) weak acid and a strong base
 - 3) weak acid and a weak base
 - 4) strong acid and a strong base

3. Given the reaction:



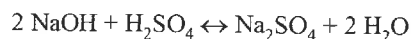
The products of this reaction form a salt solution that is

- 1) basic and turns litmus red
 - 2) acidic and turns litmus red
 - 3) acidic and turns litmus blue
 - 4) basic and turns litmus blue
4. Which statement correctly describes a solution with a pH of 9?
- 1) It has a higher concentration of H_3O^+ than OH^- and causes litmus to turn blue.
 - 2) It has a higher concentration of OH^- than H_3O^+ and causes methyl orange to turn red.
 - 3) It has a higher concentration of OH^- than H_3O^+ and causes litmus to turn blue.
 - 4) It has a higher concentration of H_3O^+ than OH^- and causes methyl orange to turn yellow.
5. When the salt NH_4NO_3 is dissolved in water, it produces a solution that is
- 1) acidic, with a pH greater than 7
 - 2) acidic, with a pH less than 7
 - 3) basic, with a pH less than 7
 - 4) basic, with a pH greater than 7

6. Which equation represents a neutralization reaction?
- 1) $2\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{H}_2\text{O}(\ell)$
 - 2) $\text{HNO}_3(\text{aq}) + \text{KOH}(\text{aq}) \rightarrow \text{KNO}_3(\text{aq}) + \text{H}_2\text{O}(\ell)$
 - 3) $\text{AgNO}_3(\text{aq}) + \text{KCl}(\text{aq}) \rightarrow \text{KNO}_3(\text{aq}) + \text{AgCl}(\text{s})$
 - 4) $4\text{Fe}(\text{s}) + 3\text{O}_2(\text{g}) \rightarrow \text{Fe}_2\text{O}_3(\text{s})$

7. Which acid-base pair will always undergo a reaction that produces a neutral solution?
- 1) a weak acid and a strong base
 - 2) a strong acid and a weak base
 - 3) a weak acid and a weak base
 - 4) a strong acid and a strong base

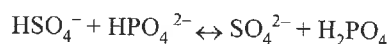
8. Given the reaction:



How many milliliters of 1 M NaOH are needed to exactly neutralize 100 milliliters of 1 M H_2SO_4 ?

- 1) 50 ml
- 2) 200 ml
- 3) 300 ml
- 4) 400 ml

9. Given the reaction:



Which pair represents an acid and its conjugate base?

- 1) HSO_4^- and SO_4^{2-}
- 2) SO_4^{2-} and HPO_4^{2-}
- 3) HSO_4^- and HPO_4^{2-}
- 4) SO_4^{2-} and H_2PO_4^-

10. What is the pH of a 0.001 M KOH solution?

- 1) 14
- 2) 11
- 3) 3
- 4) 7

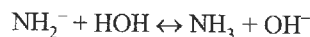
11. Which indicator is yellow in a solution with a pH of 9.8?

- 1) bromthymol blue
- 2) methyl orange
- 3) thymol blue
- 4) bromcresol green

12. Adding 0.1 M NaOH to a 0.1 M solution of HCl will cause the pH of the solution to

- 1) decrease
- 2) increase
- 3) remain the same

13. In the reaction:



The two acids are

- 1) OH^- and NH_3
- 2) OH^- and HOH
- 3) HOH and NH_2^-
- 4) HOH and NH_3

14. The $[\text{H}_3\text{O}^+]$ of a solution is 1×10^{-8} . This solution has a pH of

- 1) 8, which is basic
- 2) 8, which is acidic
- 3) 6, which is acidic
- 4) 6, which is basic

15. How are $\text{HNO}_3(\text{aq})$ and $\text{CH}_3\text{COOH}(\text{aq})$ similar?
- 1) They are Arrhenius bases and they turn red litmus blue.
 - 2) They are Arrhenius acids and they turn red litmus blue.
 - 3) They are Arrhenius acids and they turn blue litmus red.
 - 4) They are Arrhenius bases and they turn blue litmus red.
16. Which chemical equation represents the reaction of an Arrhenius acid and an Arrhenius base?
- 1) $\text{Zn}(\text{s}) + 2 \text{HCl}(\text{aq}) \rightarrow \text{ZnCl}_2(\text{aq}) + \text{H}_2(\text{g})$
 - 2) $\text{C}_3\text{H}_8(\text{g}) + 5 \text{O}_2(\text{g}) \rightarrow 3 \text{CO}_2(\text{g}) + 4 \text{H}_2\text{O}(\ell)$
 - 3) $\text{BaCl}_2(\text{aq}) + \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2 \text{NaCl}(\text{aq})$
 - 4) $\text{HC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{NaC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{H}_2\text{O}(\ell)$
17. What is the H_3O^+ ion concentration of a solution that has an OH^- ion concentration of $1.0 \times 10^{-3}\text{M}$?
- 1) $1.0 \times 10^{-3}\text{M}$
 - 2) $1.0 \times 10^{-7}\text{M}$
 - 3) $1.0 \times 10^{-11}\text{M}$
 - 4) $1.0 \times 10^{-14}\text{M}$
18. What is the pH of a 0.0001 M aqueous solution of HCl?
- 1) 1
 - 2) 2
 - 3) 3
 - 4) 4
19. Solution A has a pH of 3 and solution Z has a pH of 6. How many times greater is the hydronium ion concentration in solution A than the hydronium ion concentration in solution Z?
- 1) 2
 - 2) 1000
 - 3) 100
 - 4) 3
20. What is the name of the salt produced by the reaction of calcium hydroxide with sulfuric acid?
- 1) calcium sulfite
 - 2) calcium sulfate
 - 3) calcium thiosulfate
 - 4) calcium sulfide
21. What is the molarity of an HCl solution if 20. milliliters of this acid is needed to neutralize 10. milliliters of a 0.50 M NaOH solution?
- 1) 1.0 M
 - 2) 0.75 M
 - 3) 0.50 M
 - 4) 0.25 M
22. As an acid solution is added to neutralize a base solution, the OH^- concentration of the base solution
- 1) decreases
 - 2) increases
 - 3) remains the same
23. Equal volumes of 0.1 M NaOH and 0.1 M HCl are thoroughly mixed. The resulting solution has a pH closest to
- 1) 5
 - 2) 7
 - 3) 3
 - 4) 9
24. Which type of reaction will produce water and a salt?
- 1) esterification
 - 2) neutralization
 - 3) fermentation
 - 4) saponification
25. What volume of 0.500 M $\text{HNO}_3(\text{aq})$ must completely react to neutralize 100.0 milliliters of 0.100 M $\text{KOH}(\text{aq})$?
- 1) 10.0 mL
 - 2) 20.0 mL
 - 3) 50.0 mL
 - 4) 500. mL

Answer Key
Acid-Base Regents Unit MC [Mar 04, 2013]

1. 2
2. 4
3. 4
4. 3
5. 2
6. 2
7. 4
8. 2
9. 1
10. 2
11. 2
12. 2
13. 4
14. 1
15. 3
16. 4
17. 3
18. 4
19. 2
20. 2
21. 4
22. 1
23. 2
24. 2
25. 2