

1. Which two compounds are electrolytes?

- A) $C_6H_{12}O_6$ and CH_3CH_2OH
B) $C_6H_{12}O_6$ and HCl
C) $NaOH$ and HCl
D) $NaOH$ and CH_3CH_2OH

2. A student tested a 0.1 M aqueous solution and made the following observations:

- conducts electricity
- turns blue litmus to red
- reacts with $Zn(s)$ to produce gas bubbles

Which compound could be the solute in this solution?

- A) CH_3OH B) $LiBr$
C) HBr D) $LiOH$

3. Which 0.1 M solution contains an electrolyte?

- A) $C_6H_{12}O_6(aq)$ B) $CH_3COOH(aq)$
C) $CH_3OH(aq)$ D) $CH_3OCH_3(aq)$

4. Which sample of HCl most readily conducts electricity?

- A) $HCl(s)$ B) $HCl(\ell)$
C) $HCl(g)$ D) $HCl(aq)$

5. When dissolved in water, an Arrhenius base yields

- A) hydrogen ions B) hydronium ions
C) hydroxide ions D) oxide ions

6. Which compound is an Arrhenius acid?

- A) CaO B) HCl C) K_2O D) NH_3

7. When one compound dissolves in water, the only positive ion produced in the solution is $H_3O^+(aq)$. This compound is classified as

- A) a salt B) a hydrocarbon
C) an Arrhenius acid D) an Arrhenius base

8. According to the Arrhenius theory, an acid is a substance that

- A) changes litmus from red to blue
B) changes phenolphthalein from colorless to pink
C) produces hydronium ions as the only positive ions in an aqueous solution
D) produces hydroxide ions as the only negative ions in an aqueous solution

9. Which formula represents a hydronium ion?

- A) H_3O^+ B) NH_4^+
C) OH^- D) HCO_3^-

10. The compound $NaOH(s)$ dissolves in water to yield

- A) hydroxide ions as the only negative ions
B) hydroxide ions as the only positive ions
C) hydronium ions as the only negative ions
D) hydronium ions as the only positive ions

11. Which chemical equation represents the reaction of an Arrhenius acid and an Arrhenius base?

- A) $HC_2H_3O_2(aq) + NaOH(aq) \rightarrow NaC_2H_3O_2(aq) + H_2O(\ell)$
B) $C_3H_8(g) + 5 O_2(g) \rightarrow 3 CO_2(g) + 4 H_2O(\ell)$
C) $Zn(s) + 2 HCl(aq) \rightarrow ZnCl_2(aq) + H_2(g)$
D) $BaCl_2(aq) + Na_2SO_4(aq) \rightarrow BaSO_4(s) + 2 NaCl(aq)$

12. A solution with a pH of 11 is first tested with phenolphthalein and then with litmus. What is the color of each indicator in this solution?

- A) Phenolphthalein is colorless and litmus is blue.
B) Phenolphthalein is colorless and litmus is red.
C) Phenolphthalein is pink and litmus is blue.
D) Phenolphthalein is pink and litmus is red.

13. Water containing phenolphthalein will change from colorless to pink with the addition of

- A) HOH B) HCl C) KOH D) KCl

14. A student records the following observations about an unknown solution:

- conducts electricity
- turns blue litmus red

The student should conclude that the unknown solution is most likely

- A) an acid B) a base
C) an ester D) an alcohol

15. An aqueous solution turns litmus red. The pH of this solution could be

- A) 14 B) 11 C) 8 D) 5

16. Which pH indicates a basic solution?

- A) 1 B) 5 C) 7 D) 12

17. Which of these pH numbers indicates the highest level of acidity?

- A) 5 B) 8 C) 10 D) 12

18. Which products are formed when an acid reacts with a base?

- A) an alcohol and carbon dioxide
B) an ester and water
C) a soap and glycerine
D) a salt and water