Acids and Bases: Properties & Definitions

1. Which household substance has the **highest** pH?

a	Vinegar
b	Ammonia
c	Lemon juice
d	Carbonated soft drink

2. The hydroxide ion concentration in pure water at 25.0 ^{o}C is _____ mol/L

a	1.0×10^{-14}
b	1.0×10^{-7}
c	1.0×10^{7}
d	1.0×10^{14}

3. As a solution becomes more acidic, the pH _____.

a	decreases and the $[OH^{-}(aq)]$ decreases
b	increases and the $[OH^{-}(aq)]$ increases
c	decreases and the $[H_3O^{+}(aq)]$ decreases
d	increases and the $[H_3O^{+}(aq)]$ increases

4. A hydronium ion ($H_{3O}^{+}(aq)$) always forms when _____

a	a metallic ion dissolves in water
b	a hydrogen ion becomes hydrated
c	a base dissolves in water
d	an acid reacts with a base

5. Which of these 0.10 mol/L solutions has a pH of 7.00?

a	KCN(aq)
b	$Na_2CO_3(aq)$
c	KCl(aq)
d	HF(aq)

6. Plants are referred to as being either "acid-loving" or "base-loving". A "base-loving" plant would want to be watered with a solution that was

a	High in pH and low in $[OH^{-}(aq)]$
b	High in pH and high in $[H_3O^{+}(aq)]$
c	High in pH and low in $[H_3O^{+}(aq)]$
d	Low in pH and high in $[OH^{-}(aq)]$

7. Adding $OH^-(aq)$ drop by drop to a solution of $H_3O^+(aq)$ would _____

a	Generate hydrogen gas
b	Decrease the basic properties
c	Decrease the amount of $H_2O(l)$
d	Decrease the acidic properties

8. Liquid waste from an industrial plant was found to have a pH of 1.36. Which of the following could be added to the waste to neutralize it?

a	$NH_3(aq)$
b	$C_2H_5OH(l)$
c	NaCl(aq)
d	HCl(aq)

9. As the pH of a solution decreases, the _____

a	$[OH^-(aq)]$ increases
b	$[H_3O^+(aq)]$ increases
c	Solution becomes more basic
d	Conductivity of the solution decreases

10. A solution contains more hydrogen ions than hydroxide ions. Such a solution

a	Is neutral
b	Has a high pH
c	Is a non-electrolyte
d	Turns HPr from red to yellow

11. "A substance that increases the hydrogen ion concentration" is the

a	Arrhenius definition of an acid
b	Bronsted-Lowry definition of an acid
c	operational definition of an acid
d	Lewis definition of an acid

12. The Arrhenius definition of an acid states that an acid

a	acts as a proton acceptor
b	acts as a proton donor
c	releases hydroxide ions in solution
d	releases hydrogen ions in solution

13. An acid is defined as being strong if it

a	Has a high pH
b	Has a low $[H_3O^+(aq)]$
c	Ionizes completely in solution
d	Neutralizes a solution of HCl(aq)

14. In an operational definition of **acids,** one CANNOT say that acids

a	Are bitter to taste and turn HBb to blue
b	React with baking soda to produce water
c	Are sour to taste and turn HCh to yellow
d	React with Mg(s) to produce $H_2(g)$

15. Strong acids are strong electrolytes because

a	They dissolve as molecules
b	They have a higher pH then do bases
c	They have a high percent dissociation
d	They have a low K_a value.

16. One characteristic property of a strong base is that it

a	Has a sour taste
b	Turns H_2Tb to blue
c	Reacts with Mg(s) to form $H_2(g)$
d	Turns HCh to yellow

17. Which one of the following statements is valid?

a	A base may react with an acid to produce water
b	A weak base ionizes completely in water
c	A weak acid does not ionize at all in water.
d	An acid ionizes to produce hydroxide ions and water

18. A 0.0001 mol/L solution of nitric acid is best described as

a	A dilute weak acid
b	A concentrated strong acid
c	A dilute strong acid
d	A concentrated weak acid.

19. A 12.0 mol/L solution of $CH_3COOH(aq)$ is best described as a

a	A dilute weak acid
b	A concentrated strong acid
c	A dilute strong acid
d	A concentrated weak acid.

20. A solution conducts electricity well. It has no effect on red or blue litmus and does not react with magnesium metal. The solution could be _____

a	NaOH(aq)
b	NaCl(aq)
c	HCl(aq)
d	$CH_3OH(l)$

21. As a solution becomes more acidic, the _____ will decrease and pH will _____.

a	$[H_3O^+(aq)]$	Increase
b	$[H_3O^+(aq)]$	Decrease
c	$[OH^-(aq)]$	Increase
d	$[OH^-(aq)]$	Decrease

22. Four solutions of equal concentration were tested for conductivity, reaction with HBb, and reaction with zinc metal. The results were tabulated as follows:

Solution	Conductivity	Reaction with HBb	Reaction with Zn(s)
I	Good	Yellow	Produced H_2 (g)
II	Good	No change	No reaction
III	Poor	Yellow	Produced H_2 (g)
IV	None	No change	No Reaction

The solution that would be considered to be a solution of a weak acid is_____

a	I
b	II
c	III
d	IV

23. A negative pH would be observed in a solution which _____

a	$[H_3O^+(aq)]$ is less than [OH-(aq)]
b	$[H_3O^+(aq)]$ is more than 1.0 mol/L
c	$[H_3O^+(aq)]$ is less than 1.0×10^{-6}
d	[OH-(aq)] is more than 1.0 mol/L

24. An acid can be described as a substance that_____

a	Tastes bitter
b	Turns HCh to red
c	Increases the pH of the solution
d	Reacts with Zn(s) to produce $H_2(g)$

25. A solution contains more hydrogen ions than hydroxide ions. Such a solution

a	Is neutral
b	Has a high pH
c	Is a non-electrolyte
d	Turns HPr to yellow

Solutions:

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