

AP Chemistry: Unit - 4 - Acids and Bases Practice Test

Question 1

When citric acid is produced by the cells of an orange and dissolves in water, it produces a relatively small number of hydronium ions. Citric acid is best described as a

- A. concentrated acid.
- B. weak acid.
- C. dilute acid.
- D. strong acid.

Question 2

When a hydroxide ion is released, what does the solution become?

- A. Basic
- B. Acidic
- C. Amphoteric
- D. Proton

Question 3

What substances increase H^+ ion concentrations when dissolved in water?

- A. Brønsted-Lowry Acids
- B. Brønsted-Lowry Bases
- C. Arrhenius Acids
- D. Arrhenius Bases

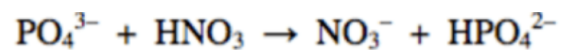
Question 4

What is the conjugate base of HCO_3^- ?

- A. HCO_3^-
- B. $H_2CO_3^-$
- C. H_2CO_3
- D. CO_3^{2-}

Question 5

What is the conjugate acid in the following equation?



- A. PO_4^{3-}
- B. HNO_3
- C. NO_3^-
- D. HPO_4^{2-}

Question 6

If a solution has a $[\text{OH}^-]$ of $3.42 \times 10^{-12}\text{M}$ what is the $[\text{H}^+]$?

- A. $2.92 \times 10^{-3}\text{M}$
- B. $3.42 \times 10^2\text{M}$
- C. $2.92 \times 10^{-2}\text{M}$
- D. $3.42 \times 10^{-5}\text{M}$

Question 7

The molar concentration of hydroxide ion in pure water at 25°C is _____.

- A. 1.00
- B. 1.0×10^{-14}
- C. 1.0×10^{-7}
- D. 0.00
- E. 7.00

Question 8

Which one of the following cannot act as a Lewis base?

- A. NH_3
- B. BF_3
- C. Cl^-
- D. CN^-
- E. H_2O

Question 9

Which of the following substances will dissolve in water to produce an acidic solution?

- A. NH_3
- B. Na_2O
- C. $\text{NaC}_2\text{H}_3\text{O}_2$
- D. $\text{C}_6\text{H}_{12}\text{O}_6$
- E. FeCl_3

Question 10

Determine the pH of a 0.15-M aqueous solution of KF. For hydrofluoric acid, $K_a = 7.0 \times 10^{-4}$.

- A. 5.83
- B. 6.59
- C. 8.16
- D. 2.33
- E. 12.01

Question 11

Using the data in the table, which of the conjugate bases below is the strongest base?

Acid	K_a
HOAc	1.8×10^{-5}
HCHO ₂	1.8×10^{-4}
HClO	3.0×10^{-8}
HF	6.8×10^{-4}

- A. F^-
- B. ClO^-
- C. CHO_2^-
- D. OAc^-
- E. OAc^- and CHO_2^-

Question 12

What is the pH of an aqueous solution at 25°C in which $[\text{OH}^-]$ is 0.0025 M?

- A. +2.60
- B. -2.60
- C. +11.40
- D. -11.40
- E. -2.25

Question 13

Which solution below has the highest concentration of hydroxide ions?

- A. pH = 3.21
- B. pH = 9.82
- C. pH = 7.93
- D. pH = 12.59
- E. pH = 7.00

Question 14

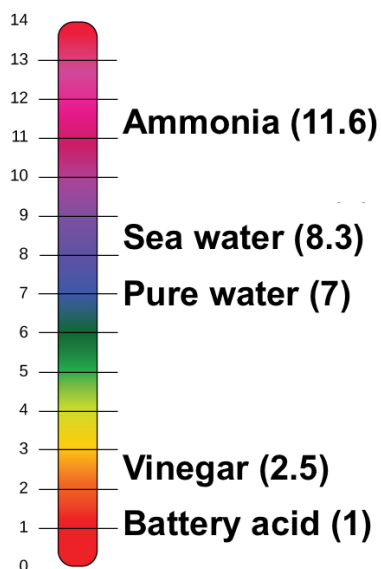
The human stomach needs to maintain a pH level between 1 and 2 in order to properly digest food.

What is true regarding the environment of the human stomach?

- A. It is basic.
- B. It is neutral.
- C. It is acidic.
- D. It can switch between being basic and acidic.

Question 15

The scale below shows the pH levels of various liquids.



Which of the following substances is neutral?

- A. Pure water
- B. Sea water
- C. Battery acid
- D. Vinegar

Question 16

Classify the acidity of hydrofluoric acid, HF, based on its reactivity in aqueous solution.

- A. Weak acid
- B. Strong Acid
- C. Neutral
- D. Basic

Question 17

Classify the acidity of nitric acid, HNO₃, based on its reactivity in aqueous solution.

- A. Weak acid
- B. Strong Acid
- C. Neutral
- D. Basic

Question 18

Classify the basicity of pyridine, C_5H_5N , based on its reactivity in aqueous solution.

- A. Weak base
- B. Strong Base
- C. Acidic
- D. Neutral

Answer Key

1. B
2. A
3. C

4. D
5. D
6. A
7. C
8. B
9. E
10. C
11. B
12. C
13. D
14. C
15. A
16. A
17. B
18. A