

Name: _____ Period: _____ Date: _____

Acid and Base Practice Test

- A solution in which the hydroxide-ion concentration is 1×10^{-5} M is:
a. acidic b. basic c. neutral d. none of these
- The formula of the hydrogen ion is often written as:
a. H_2O b. OH^- c. H^+ d. H_3O^-
- What is the pH of a solution in which $[H^+] = 1 \times 10^{-12}$?
a. -1.0 b. -2.0 c. 2.0 d. 12.0
- What is the pH of a 0.01 M hydrochloric acid solution?
a. 10^{-2} b. 12.0 c. 2.0 d. 10^{-12}
- What is the name of the acid whose formula is H_2SO_4 ?
a. hydrosulfuric acid b. sulfurous acid c. sulfuric acid d. hyposulfurous acid
- A solution in which the $[H^+] = 1.0 \times 10^{-4}$ mol/L is said to be:
a. acidic b. basic c. neutral d. none of these above
- When 42.5mL of 1.03M NaOH is added to 50.0mL of vinegar (acetic acid), the indicator changes color. (hint: $M_1V_1 = M_2V_2$)
$$CH_3COOH(aq) + NaOH(aq) \rightarrow H_2O(l) + CH_3COONa(aq)$$

What is the concentration of acetic acid in vinegar? a. 3.45M b. 2.44M c. 0.88M d. 1.24M
- A solution with a pH of 9 has a $[OH^-]$ concentration of:
a. 1.0×10^{-14} mol/L b. 1.0×10^{-9} mol/L c. 1.0×10^{-5} mol/L d. 1.0×10^{-7} mol/L
- Which of the following is true about bases?
a. have a bitter taste b. feel slippery
b. react with acids to form water and salt d. all of these

Short Answer: you must show your work to get full credit.

Name the following acids:

a. HI hydroiodic acid

b. KOH potassium hydroxide

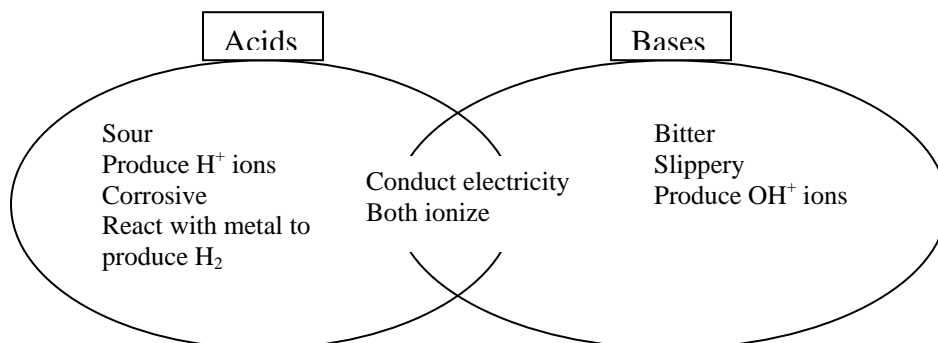
c. Mg(OH)₂ magnesium hydroxide

d. HNO₂ nitrous acid

1. Compare and contrast strong and weak acids. What is it that makes an acid strong?

- Strong acids and bases completely dissociate (break apart) in water
- Weak acids partially dissociate
- A strong acid ionizes completely, and has a greater concentration of H⁺ ions

2. and 3. Draw a Venn diagram showing two properties of acids, two of bases, and two that acids and bases have in common.



4. What is the pH of a 4.2 L solution containing 0.51 g of nitric acid?

Nitric acid = HNO₃

.51 grams/number of moles = 63 grams per mole/1 mole

Number of moles = .008

-log(.008) = **2.097** = pH

5. Water can act as an acid or base depending on whether it donates or accepts a proton (H⁺). When water acts as an acid it donates a proton. As a base it accepts a proton.

6. Arrhenius describes acids as H⁺ and bases as OH⁻. This is a more limited acid base theory. Bronsted-Lowery has a wider application (for example NH₃ will accept a proton and is therefore a base). Acids will donate protons while bases accept protons.

7. A buffer resists changes in pH. Blood is a buffer.

BCR: Muriatic acid (concentrated HCl) is commonly used to remove excess mortar from the surface of newly erected brick structures. Suppose a new fireplace has been built in your home. The brick mason accidentally spills some of the muriatic acid on the floor. Fearing that the floor will be permanently damaged, and knowing that you have recently completed a chemistry course, he asked for your advice on cleaning up the spill.

- a. Suggest a common household chemical that could be used to safely clean up the spill.
Baking soda is a weak base and would neutralize the muriatic acid. Since baking soda is a weak base it wouldn't be a problem if too much was used.
- b. Provide the formula for the chemical you chose and explain your choice.
NaHCO₃
- c. Describe the chemical reaction that takes place between the acid and the household chemical.

