

## New West Charter High School -- Chemistry -- Unit 5 -- Exam #4 -- 90 points

In everything you do here, be as neat as you can be -- PLEASE. Show ALL of your work; just giving the answer will not get you full credit, but partial achievement will earn you partial credit. PENCILS!

Write TRUE if the statement is true, OR write the word that substitutes for the underlined word that would make it true. Writing false only earns partial credit. Three points apiece.

- \_\_\_\_\_ 1) The most common acid you would find in a car's battery is hydrofluoric acid.
- \_\_\_\_\_ 2) The gas evolved from the reaction between sodium and water was carbon dioxide.
- \_\_\_\_\_ 3) Placing the copper wire into the silver solution turned the solution blue.
- \_\_\_\_\_ 4) Adding salt to water would result in a higher boiling point for the water.
- \_\_\_\_\_ 5)  $\text{pH} + \text{pOH} = 7$ .
- \_\_\_\_\_ 6) Molecules that have additional water molecules attached to them are called miscible.
- \_\_\_\_\_ 7) The  $\text{H}_3\text{O}^+$  ion is called the hydrochloric ion.
- \_\_\_\_\_ 8) There were a lot of things to memorize for this test. I have to treat the subject more seriously in the future if I want a good grade.

Match Those Acids! Two points each.

- |   |                       |                               |
|---|-----------------------|-------------------------------|
| _____ 9) $\text{HNO}_3$                     | a) sulfuric acid      | j) phosphoric acid            |
| _____ 10) $\text{H}_2\text{CO}_3$           | b) carbonic acid      | k) fluoric acid               |
| _____ 11) $\text{HC}_2\text{H}_3\text{O}_2$ | c) nitrous acid       | l) hydrofluoric acid          |
| _____ 12) $\text{H}_3\text{PO}_4$           | d) hydrochloric acid  | m) perchloric acid            |
| _____ 13) $\text{H}_2\text{SO}_4$           | e) hydrosulfuric acid | n) lysergic acid              |
|   | f) acetic acid        | o) hydrobromic acid           |
|   | g) nitric acid        | p) not this acid              |
|   | h) phosphorous acid   | q) not this one either        |
|   | i) sulfurous acid     | r) why are you reading these? |

Short Answer/Fill-in. Three points each.

- 14) We dissolve a \_\_\_\_\_ in a \_\_\_\_\_ to form a \_\_\_\_\_.
- 15) Molarity means \_\_\_\_\_.
- 16) In order to determine the concentration of an unknown base, we use a buret to carefully add a controlled amount of acid in a chemical technique called \_\_\_\_\_.
- 17) Name either reagent used to show off the endothermic reaction (cold and smelly!): \_\_\_\_\_
- \_\_\_\_\_.

18) Name three substances from the lab experiment that were found to be basic: \_\_\_\_\_

\_\_\_\_\_ and \_\_\_\_\_.

19) Give three characteristics of acids: a) \_\_\_\_\_,

b) \_\_\_\_\_ and c) \_\_\_\_\_.

20) What is the difference between a strong acid and a weak one? \_\_\_\_\_

\_\_\_\_\_.

21) For three points, circle the substance with the lowest pH:

saliva

lemon juice

black coffee

acid rain

pure water

Multiple Choice. Write the letter in the blank that best answers each question. Three points each.

\_\_\_\_\_ 22) Which of the following is not a colloid?

a) sugar water

b) fog

c) foam

d) mayonnaise

\_\_\_\_\_ 23) A solute depresses the freezing point because the solute \_\_\_\_\_.

a) is colder than the solvent

b) disrupts crystal formation of the solvent

c) has bigger molecules than the solvent

d) tends to sink to the bottom of the solvent

\_\_\_\_\_ 24) What mass of  $\text{Na}_2\text{SO}_4$  is needed to make 2.5 L of 2.0 M solution? (Na = 23 g, S = 32 g, O = 16 g)

a) 178 g

b) 284 g

c) 356 g

d) 710 g

\_\_\_\_\_ 25) The term electrolyte refers to solutions that \_\_\_\_\_.

a) can conduct an electric current

b) that have a lower than normal boiling point

c) have nonpolar covalent bonds

d) that do not contain either  $\text{H}^+$  or  $\text{OH}^-$  ions

\_\_\_\_\_ 26) All of these increase the rate of dissolution except \_\_\_\_\_.

a) increasing the temperature

b) stirring the solution

c) decreasing the temperature

d) increasing the surface area of the solute

\_\_\_\_\_ 27) All are categories of experimental errors except \_\_\_\_\_.

a) personal error

b) precision error

c) systematic error

d) random error

Calculation Section -- Be sure to show ALL of your work for credit -- writing the answer alone will not get you full credit. Also, write any pertinent equation(s) you use. Five points each.

28) What is the pH of 0.003 M solution of HCl?

29) You are given a solution of concentrated 15.6 M nitric acid. How many mL of it would you need to make 2500 mL of 0.78 M solution of nitric acid?

30) Look at the solubility curves at the right and answer the following questions. One point each.

a) What is the solubility of salt at 80 °C?

b) At what temperature are the solubilities of sodium nitrate and potassium nitrate equal?

c) Yes or No. Do any of the solids exhibit reverse solubility?

d) Which substance has the lowest solubility at 10 °C?

