Name: _____ Blk: _____- Date

MEASUREMENT AND MATTER Online Quiz

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

_____ 1. Chemistry is defined as the study of the composition and structure of materials and
a. the categories of matter.
b. the changes in matter.
c. the electrical currents in matter.
d. molecules in living things.

_____ 2. Chemical properties
a. include changes of state of a substance.
b. include mass and color.
c. include changes that alter the identity of a substance.
d. can be observed without altering the identity of a substance.

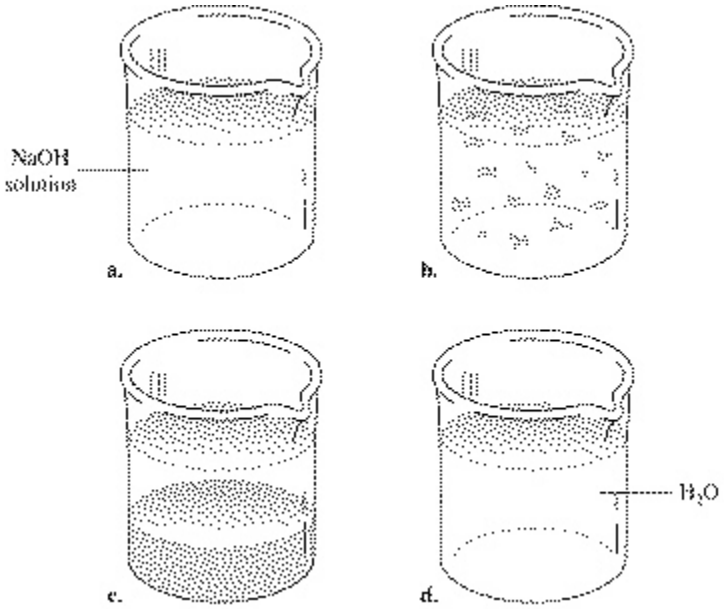
_____ 3. Two features that distinguish matter are
a. mass and velocity.
b. weight and velocity.
c. mass and volume.
d. weight and volume.

_____ 4. An example of an extensive physical property is
a. mass.
b. density.
c. color.
d. boiling point.

_____ 5. A chemical change occurs when
a. dissolved minerals solidify to form a crystal.
b. ethanol is purified through distillation.
c. salt deposits form from evaporated sea water.
d. a leaf changes color.

_____ 6. A physical change occurs when a
a. peach spoils.
b. copper bowl tarnishes.
c. bracelet turns your wrist green.
d. glue gun melts a glue stick.

7. The state of matter in which a material has definite shape and definite volume is the
   a. liquid state.
   b. solid state.
   c. gaseous state.
   d. vaporous state.



8. The homogeneous mixture in the illustration above is in container
   a. a.
   b. b.
   c. c.
   d. d.

9. The reason for organizing, analyzing, and classifying data is
   a. so that computers can be used.
   b. to prove a law.
   c. to find relationships among the data.
   d. to separate qualitative and quantitative data.

10. Which of the following observations is quantitative?
   a. The liquid turns blue litmusc. The liquid tastes bitter.
      paper red.
   b. The liquid boils at 100ºC.
   d. The liquid is cloudy.

11. A theory is best described as a
   a. series of experimental observations.
   b. generalization that explains a body of known facts or phenomena.
   c. scientifically proven fact.
   d. testable statement.

12. A true statement about mass is that
    a. mass is often measured with a spring scale.
    b. mass is expressed in pounds.
    c. as the force of Earth's gravity on an object increases, the object's mass increases.
    d. mass is determined by comparing the mass of an object with a set of standard masses that are part of a balance.

13. To determine density, the quantities that must be measured are
    a. mass and weight.
    b. volume and weight.
    c. volume and concentration.
    d. volume and mass.

14. The density of aluminum is 2.70 g/cm^3. The volume of a solid piece of aluminum is 1.50 cm^3. Find its mass.
    a. 1.50 g
    b. 1.80 g
    c. 2.70 g
    d. 4.05 g

15. The density of pure diamond is 3.5 g/cm^3. The mass of a diamond is 0.25 g. Find its volume.
    a. 0.071 cm^3
    b. 0.875 cm^3
    c. 3.5 cm^3
    d. 14 cm^3

16. 0.25 g is equivalent to
    a. 250 kg.
    b. 250 mg.
    c. 0.025 mg.
    d. 0.025 kg.

17. If 1 inch equals 2.54 cm, how many centimeters equal 1 yard?
    a. 0.07 cm
    b. 14.17 cm
    c. 36 cm
    d. 91.4 cm

18. A measurement is said to have good precision if it
    a. agrees closely with an accepted standard.
    b. agrees closely with other measurements of the same quantity.
    c. has a small number of significant figures.
    d. has a large number of significant figures.

19. If some measurements agree closely but differ widely from the actual value, these measurements are
    a. neither precise nor accurate.
    b. accurate, but not precise.
    c. acceptable as a new standard of accuracy.
    d. precise, but not accurate.

20. These values were obtained as the mass of products from the same reaction: 8.83 g; 8.84 g; 8.82 g. The known mass of products from that

reaction is 8.60 g. The values are

a. accurate.
b. precise.
c. both accurate and precise.
d. neither accurate nor precise.

21. To two significant figures, the measurement 0.0255 g should be reported as

a. 0.02 g.
b. 0.025 g.
c. 0.026 g.
d. 2.5×10^2 g.

22. The number of significant figures in the measurement 0.000 305 kg is

a. 3.
b. 4.
c. 5.
d. 6.

23. Using a metric ruler with 1 mm divisions, you find the sides of a rectangular piece of plywood are 3.54 cm and 4.85 cm. You calculate that the area is 17.1690 cm^2. To the correct number of significant figures, the result should be expressed as

a. 17.1 cm^2.
b. 17.169 cm^2.
c. 17.17 cm^2.
d. 17.2 cm^2.

24. All of the following are properties of antimony. Which one is **not** a physical property?

a. It is a solid at room temperature.
b. It has both yellow and gray forms (allotropes) in the solid state.
c. It burns in an atmosphere of chlorine.
d. It is one of the few substances that expands upon freezing.

25. Which statement is **false**?

a. All samples of a particular pure substance have the same composition and properties.
b. A compound is a substance that can be decomposed by chemical means into simpler substances.
c. Different mixtures of the same two substances can have different compositions.
d. An example of a heterogeneous mixture is one prepared by dissolving the solid, sodium chloride (table salt), in the liquid, water.

26. Trying to identify a sample of a pure substance, a student makes the following observations:

I. It has a mass of 5400 g.
II. It is 10. cm long, 10. cm wide, and its height is 20. cm.
III. It is a shiny solid at room temperature.
IV. It dissolves in hydrochloric acid.
V. It melts at 660^{o}C.
VI. It is a good conductor of electricity.
Which response includes all of these observations that, **individually or in combination**, would be helpful in identifying the substance of which the sample is composed?

a. I, II, III, IV, V, and VI
b. II, IV, V, and VI
c. I, III, IV, and V
d. III and IV

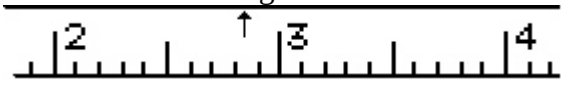
Short Answer

27. In one experiment, magnesium metal is melted. In a second experiment, magnesium metal is burned. Classify the change in each experiment as chemical or physical. Explain your reasoning.

28. Distinguish between mass and weight.

29. Distinguish between precision and accuracy.

30. Record the following measurements in the correct sig figs.



31. The statement, "Osmium has a density of 22.59 g/mL, which makes it the densest element known" is an example of? :Explain
    - •a theory
    - •an experimental observation
    - •a hypothesis
    - •a law

32. A blue crystalline material is heated strongly in a test tube. A clear liquid condenses around the mouth of the tube and the crystals gradually lose their blue color and become white powder. Every gram of blue crystal produces 0.36 g of clear liquid and 0.64 g of colorless powder. The same weight relationships are observed for samples of the crystals taken from many different sources. These observations are consistent with the hypothesis that the blue crystals are: Justify your choice.
    - •an element
    - •a solution
    - •a compound
    - •a heterogeneous mixture
    - • a wet salt