Name: *date:*

Matter Practice Exam

1.____Which substance ***cannot*** be decomposed into simpler substances?

a) ammonia b) aluminum c) methane d) methanol

2.____Consider the following reaction: $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$, what kind of change do the reactants undergo in the reaction?

a) phase change b) physical change c) chemical change d) nuclear change

3.____Which is a substance?

a) NaCl(aq) b) $H_2O(g)$ c) air d) all of them

4.____Which statement is always true concerning a compound?

a) it is made up of two elements b) its ratio is definite
c) it can be homogenous or heterogeneous d) it is a solid

5.____In an equation, which symbol would indicate a mixture?

a) $CO_2(g)$ b) $CO_2(l)$ c) $CO_2(s)$ d) $CO_2(aq)$

6. ____Which of the following substances has indefinite shape, but definite volume?

a) $H_2O(l)$ b) $C_6H_{12}O_6(s)$ c) $CH_4(g)$

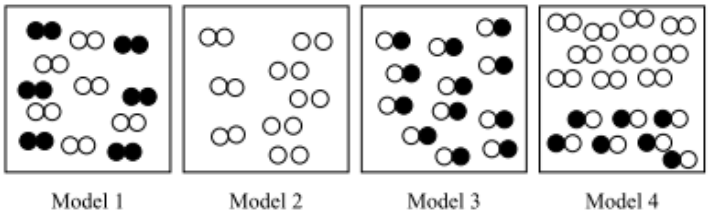
7.____When sample X is passed through a filter paper a white residue remains on the paper and a clear liquid passes through. When the liquid is vaporized, another white residue remains. Sample X is best classified as

a) an element c) a compound
b) a heterogeneous mixture d) a homogeneous mixture

8.____A student observed the following reaction: $AlCl_3(aq) + 3NaOH(aq) \rightarrow Al(OH)_3(s) + 3NaCl(aq)$ After the products were filtered, which substance remained on the filter paper?

a) $AlCl_3(aq)$ b) NaOH(aq) c) $Al(OH)_3(s)$ d) NaCl(aq)

9.____Which particle diagram(s) represent a mixture of elements?



a) Model 1, only b) Model 2, only c) Models 1 and 4 d) Models 1, 3 and 4

10. ____ 5 grams of sugar are poured into a test tube that already has water with 2.5 grams of salt dissolved in it. All of the sugar dissolves as well. The entire content of the test tube is called

a) a compound b) a homogeneous mixture c) heterogeneous mixture

11. ____ Cherry coke can be separated using distillation because the different components have been combined

a) chemically and have similar boiling points
b) chemically and have different boiling points
c) physically and have similar boiling points
d) physically and have different boiling points

12. ____ A student combines sand and salt in a beaker to create a mixture. Which of the following is true concerning each component after they combine?

a) The sand becomes soluble.
b) The salt's melting point raises.
c) The salt remains soluble.
d) The sand turns white.

13. ____ Lab-grade hydrogen peroxide (the stuff we do experiments with) contains 35% H_2O_2 and 65% water. Household hydrogen peroxide (the stuff you pour on your cuts and scrapes) is only 10% H_2O_2 and 90% water. What can you conclude about hydrogen peroxide based on this information?

a) It is a compound and its components have a definite ratio.
b) It is a compound and the ratio of its components can vary.
c) It is a mixture and its components have a definite ratio.
d) It is a mixture and the ratio of its components can vary.

14. ____ Which of the following is a chemical property of magnesium?

a) It has luster.
b) It reacts with acid to make gas.
c) It is malleable.
d) It is silver.

15. ____ Which statement describes a chemical property of iron?

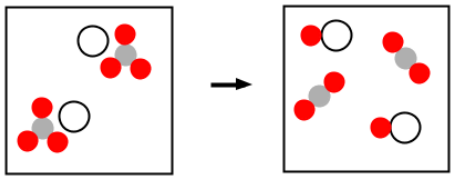
a) Iron can be flattened into thin sheets.
b) Iron conducts electricity and heat.
c) Iron combines with oxygen to form rust.
d) Iron melts at 1,538°C.

16. ____ An example of a physical property of an element is the element's ability to

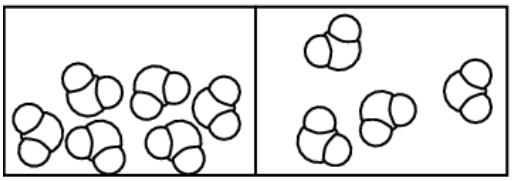
a) react with an acid
b) react with oxygen
c) form a compound with chlorine
d) form an aqueous solution

17. ____ Which statement below is true regarding particle diagrams 1 and 2 below?

1)



2)



a) Diagram 1 represents a chemical change and 2 represents a physical change.
b) Diagram 1 represents a physical change and 2 represents a chemical change.
c) Both diagrams represent physical changes.
d) Both diagrams represent chemical changes.

18. ____ Which equation(s) below represents a physical change?

1) $Mg(s) + HCl(aq) \rightarrow MgCl_2(s) + H_2(g)$
2) $CO_2(s) \rightarrow CO_2(g)$
3) $LiBr(s) + H_2O(l) \rightarrow LiBr(aq)$

a) 1, only
b) 2, only
c) 2 and 3
d) all of them

19. ____ According to the equation: $2H_2(g) + O_2(g) \rightarrow 2H_2O(g)$, if we want to produce 18 grams of water and have 2 grams of hydrogen, how much oxygen do we need to react with?

a) 18 grams b) 2 grams c) 16 grams d) 20 grams

20. ____ A substance has a volume of 8.0 ml and a mass of 21.6 grams. The density of the cube is best expressed as

a) 2.7 g/ml b) 2.70 g/ml c) 0.37 g/ml d) 0.370 g/ml

21. ____ In a laboratory exercise to determine the density of a substance, a student found the mass to be 6.00 grams and the volume to be 2.0 milliliters. Expressed to the correct number of significant figures, the density of the substance is

a) 3.000 g/ml b) 3.00 g/ml c) 3.0 g/ml d) 3 g/ml

22. ____ A student measure the density of an object to be 0.80 g/ml. The actual density of the object is 0.70 g/ml. What is the percent error?

a) 0.17% b) 0.14% c) 17% d) 14%

23. ____ Which of the following statements is true regarding diamond and graphite?

a) They have different molecular structures, only.
b) They have different properties, only.
c) They have different molecular structures and different properties.
d) They have the same molecular structure and the same properties.

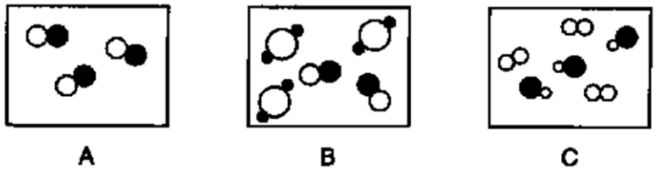
24. ____ Which statement best describes a chemical change?

a) They include phase changes.
b) Appearance changes, but chemical makeup stays the same.
c) A new substance is always created.

25. ____ Which of the following properties is NOT helpful in identifying an unknown substance?

a) melting point b) solubility c) density d) temperature

Base your answers to questions 26-27 on the particle diagrams below.



26. Explain, ***in terms of composition***, why sample A represents a pure substance.

27. Explain, ***in terms of particle arrangement***, why box C is a homogeneous mixture.

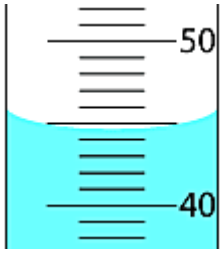
28. Consider the following substances: Co, CO, $MgCl_2$, Cl_2 - Which are considered compounds and how do you know?

29. In Box A, draw a particle diagram, which shows a **homogeneous mixture** of **two** different **elements** in the **liquid** phase. In Box B, draw a particle diagram, which shows a **compound** made of **two elements** in the **gas** phase.

Box A **Box B**

30. When methane burns, the reaction is as follows: $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$. If 16 grams of methane react with 64 grams of oxygen to produce 36 grams of water, how much carbon dioxide was made?

31. Measure the volume of this liquid to the correct decimal place: _____ ml



32. When an ice cube is placed in water, it floats. Compare the density of liquid water to the density of solid water.