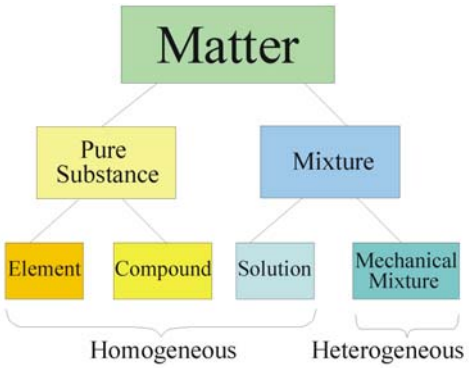
Chemistry A and B: Form TR3-8A Name _____

REVIEW Date _____ Period _____

Test Review № 3



Matter. Matter is anything that has mass and takes up space. Pure matter can be classified as elements or compounds. Elements are simple substances that can't be broken down by chemical means. Gold is an example. Compounds are composed of two or more elements chemically combined. The properties of elements are not retained when they combine to form a compound. The composition of compounds is fixed, and is shown by a formula. Mixtures are composed of two or more substances blended together. The composition of mixtures is variable. The properties of the substances in a mixture are retained. This fact is useful for separating a mixture. For example, a mixture of iron and sand can be separated using a magnet, because the iron is still magnetic. A solution is a homogeneous mixture. It consists of a solute and a solvent. The solvent is the continuous phase. A mechanical mixture is a heterogeneous mixture. It has two or more phases. Solutions in water appear clear, while mechanical mixtures in water often appear cloudy. Suspensions are mechanical mixtures in which the particles settle over time. Colloidal dispersions are mechanical mixtures that don't settle over time. They have smaller particles than suspensions, but larger particles than solutions. Mechanical mixtures can scatter a beam of light making it look like headlights in fog. This is called the tyndal effect.

Element Symbols. In 1814 Jöns Berzelius, a Swedish chemist, devised the system of symbols used by scientists. The goal of his symbols was to make it easy to write chemical observations in shorthand that could be easily understood. Many symbols are just the first letter of the element's name, upper case. Carbon, for example is C. Other symbols have two letters from the element's name, with the first being upper case and the second being lower case. Examples include calcium, Ca, and cadmium, Cd. Some element's symbols are based on the Latin name such as copper (Cu = cuprum) and lead (Pb = plumbum)

Early Theories of Matter. Democritus (Greek Philosopher ~460 BC) proposed all that matter is composed of particles called atoms (Greek for "uncuttable"). He envisioned atoms of different substances as having different geometric shapes. The idea did not gain acceptance. **Aristotle** proposed that there were four elements: earth; air; fire; and water. This idea gained acceptance because substances appeared to have different degrees of each of these building blocks. For example, a burning, green stick releases smoke (air), water, and ash (earth), and since it burns, it obviously contains fire. The Aristotelian view lasted for almost 2,000 years.

Answer the questions below by circling the number of the correct response

1. Which of the following is NOT matter? (1) a chair (2) air (3) light (4) water
2. How many elements are there according to Aristotle? (1) 1 (2) 2 (3) 3 (4) 4
3. Which of the following is NOT a property of matter? (1) inertia (2) occupies space (3) composed of elements (4) weightlessness
4. Which of the following may be heterogeneous? (1) elements only (2) compounds only (3) mixtures only (4) either elements or compounds
5. Which of the following is pure? (1) elements only (2) compounds only (3) mixtures only (4) either elements or compounds
6. Which of the following consists of more than one substance? (1) elements only (2) compounds only (3) mixtures only (4) either elements or compounds
7. Which of the following are types of matter? (1) elements only (2) compounds only (3) mixtures only (4) all of these
8. Which of the following is a type of mixture? (1) elements only (2) compounds only (3) solutions only (4) elements or compounds
9. Which of the following is matter? (1) love (2) ideas (3) rock (4) heat
10. The tendency of matter to maintain its state of motion is known as (1) density, (2) inertia, (3) mass, (4) volume.
11. Which of the following is NOT composed of two or more types of atoms? (1) element (2) compound (3) solution (4) mechanical mixture
12. Which represents a homogeneous mixture? (1) $CuSO_4(s)$ (2) NaCl(aq) (3) $Br_2(\ell)$ (4) $CO_2(g)$
13. Which substance can be decomposed by a chemical change? (1) ammonia (2) iron (3) argon (4) helium
14. The symbol for potassium is (1) P, (2) K, (3) Sn, (4) Po.
15. The symbol for gold is (1) Ag, (2) Au, (3) Ga, (4) Na.

16. Sb is the symbol for (1) antimony, (2) sulfur, (3) mercury, (4) tin.

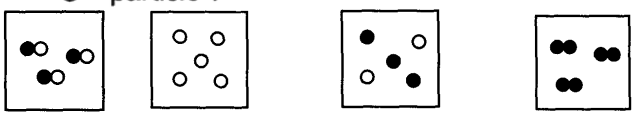
17. The matter in a container is composed of hydrogen and oxygen. When the contents of the container are added to a fire, the fire goes out. This shows that the hydrogen and oxygen in the container are (1) mixed to form a solution, (2) mixed to form an emulsion, (3) chemically combined to form a compound, (4) separate elements.

18. A bottle of green food coloring, which was left standing on a shelf for a long time, separated into distinct blue and yellow layers. The food coloring was most likely (1) an element, (2) a compound, (3) a mixture, (4) changing phase.

19. A light that is shined through the material in a container is reflected in such a way that it forms a visible ray or beam. The material in the container could be (1) an element, (2) a compound, (3) a solution (4) a mechanical mixture

20. Material left in a container separates into two phases. The material in the container could be a (1) compound, (2) solution, (3) element, (4) mechanical mixture.

21. Given: ● = particle X ○ = particle Y Which diagram represents a mixture?



(1) (2) (3) (4)

22. The *Tyndall Effect* in colloidal dispersions is due to (1) absorption of light (2) merging of light rays (3) scattering of light (4) convergence of light rays

23. Which of the following will show the *Tyndall Effect*? (1) element (2) compound (3) solution (4) suspension

24. Which statement does not describe a compound? (1) It is a pure substance. (2) Its components are mixed in any proportion by mass. (3) It cannot be separated into constituents by physical means. (4) It is composed of two or more elements.

25. Which of the following is not a mixture? (1) blood (2) pennies (3) saliva (4) calcium

26. Which mixture can be separated by filtration? (1) water and sand (2) salt and sugar (3) salt and carbon dioxide (4) sugar and carbon dioxide

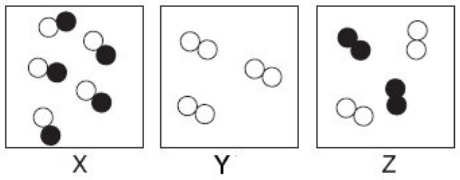
27. When a mixture of water, sand, and salt is filtered, what passes through the filter paper? (1) water, only (2) water and sand, only (3) water and salt, only (4) water, sand, and salt

28. Which of the following has the smallest particles? (1) a mechanical mixture (2) a solution (3) a suspension (4) a colloidal dispersion

29. Which must be a mixture of substances? (1) solid (2) liquid (3) gas (4) solution

30. A bottle of rubbing alcohol contains both 2-propanol and water. These liquids can be separated by the process of distillation because the 2-propanol and water (1) have combined chemically and retain their different boiling points. (2) have combined chemically and have the same boiling point. (3) have combined physically and retain their different boiling points. (4) have combined physically and have the same boiling point.

31. Given the diagrams X, Y, and Z below:

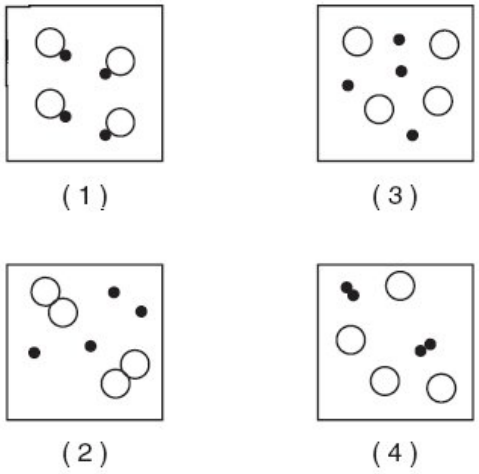


X Y Z

Key
Atom of element A = ○
Atom of element B = ●

Which diagram or diagrams represent a mixture of elements A and B? (1) X, only (2) Z, only (3) X and Y (4) X and Z

32. Which particle diagram represents one pure substance, only?



(1) (3) (2) (4)

33. In which type of mixture will the particles settle over time? (1) solution (2) suspension (3) colloidal dispersion (4) homogeneous

34. In 1661, Robert Boyle proposed that matter is composed of simple substances called elements that cannot be broken down by chemical means. His theory was not accepted for over 100 years because (1) he lacked qualitative evidence, (2) he lacked quantitative evidence, (3) he lacked both qualitative and quantitative evidence, (4) he was a philosopher rather than a scientist.

35. Boyle proposed that matter is composed of simple substances called elements that cannot be further decomposed or broken down. Aristotle's idea that air was an element did not fit Boyle's definition because air (1) cannot be seen, (2) cannot be broken down, (3) can be decomposed, (4) can react with other substances.

36. Antoine Lavoisier measured the mass of some mercury. Then he heated it in air. The mercury turned into a red substance as it was heated. The mass of the red substance was greater than the mass of the mercury. The best explanation for this observation is that (1) matter was created, (2) a new element formed, (3) the mercury combined with something in the air, (4) hot mercury is heavier than cold mercury.

37. Lavoisier heated mercury until a red substance formed. Then he heated the red substance and it broke down into mercury and oxygen. From his observations it is reasonable to conclude (1) mercury and oxygen are elements and the red substance is a compound composed of mercury and oxygen, (2) mercury, oxygen, and the red substance are elements, (3) the red substance is an element, and mercury and oxygen are compounds composed from it, (4) mercury, oxygen, and the red substance are compounds.

38. When Lavoisier heated mercury II oxide, it decomposed into mercury and oxygen. The mass of the mercury II oxide was equal to the mass of the mercury plus the mass of the oxygen. This shows that during the chemical reaction (1) matter was not created but it was destroyed, (2) matter was created but it was not destroyed, (3) mater was both created and destroyed, (4) matter was neither created nor destroyed.

39. An 18 kg sample of water is decomposed by electrolysis, releasing 16 kg of oxygen. How much hydrogen was released? (1) 34 kg (2) 2 kg (3) 16 kg (4) 1.125 kg

40. If 46 g of X combines with 16 g of Y to form Z, how much Z is formed? (1) 30 g (2) 2.9 g (3) 724 g (4) 62 g

Answers

1. 3	11. 1	21. 3	31. 2
2. 4	12. 2	22. 3	32. 1
3. 4	13. 1	23. 4	33. 2
4. 3	14. 2	24. 2	34. 2
5. 4	15. 2	25. 4	35. 3
6. 3	16. 1	26. 1	36. 3
7. 4	17. 3	27. 3	37. 1
8. 3	18. 3	28. 2	38. 4
9. 3	19. 4	29. 4	39. 2
10. 2	20. 4	30. 3	40. 4