Lesson Check Answers

1. Every sample of a given substance has the same chemical composition.
2. solid, liquid, gas
3. Physical changes are either reversible or irreversible. Reversible changes can be "undone," or reversed. Irreversible changes cannot be undone.
4. intensive and extensive properties
5. Color; sodium chloride is the only white solid listed.
6. Liquids and gases both have an indefinite shape. The shape of a solid is definite; the shape of a liquid is indefinite.
7. The freezing of mercury is reversible because solid mercury can be melted.
8. Samples of platinum and copper can have the same mass and volume (extensive properties). They cannot have the same set of intensive properties because they have different chemical compositions.

Sample Problems

10. Iron is magnetic; table salt is not. Table salt will dissolve in water; iron will not.

11. By lowering the temperature to below the boiling point of each gas, you could condense each substance and separate the gases.

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12. as heterogeneous or homogeneous
13. differences in physical properties
14. A phase is any part of a sample with uniform composition. A homogeneous mixture has one phase; a heterogeneous mixture has two or more phases.
15. **a.** homogeneous **b.** heterogeneous **c.** homogeneous **d.** heterogeneous
16. Both have a uniform composition throughout. A substance has a definite composition; a solution has a variable composition.
17. Filtration separates solids from a liquid in a heterogeneous mixture. Distillation can separate a liquid from substances dissolved in the liquid.
18. Add water to dissolve the salt. Filter the mixture to remove the sand. Evaporate the water from the liquid to isolate the solid salt.
19. **BIG**IDEA Answers will vary; examples of mixtures at home include: sorting laundry, draining cooked pasta, putting away bags of groceries.

Sample Problems

20. Liquid A is probably a pure substance because it left no residue (meaning it is not a mixture). Liquid B is a mixture because its components could be separated.

21. The liquid was not an element because a solid was left when the liquid evaporated. A physical process, such as evaporation, cannot be used to break down a compound (chemical). Therefore, the liquid was a mixture.

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22. Compounds can be broken down into simpler substances by chemical means, but elements cannot.

23. A substance has a fixed composition. The composition of a mixture may vary.

24. Chemical symbols are used to represent elements. Chemical formulas are used to represent compounds.

25. It allows you to compare the properties of the elements.

26. heating or an electric current

27. **a.** compound **c.** mixture
b. mixture **d.** element

28. **a.** Pb **c.** Ag **e.** H
b. O **d.** Na **f.** Al

29. **a.** carbon **c.** potassium **e.** iron
b. calcium **d.** gold **f.** copper

30. Carbon, hydrogen, oxygen, and nitrogen; hydrogen is present in the greatest proportion by number of atoms.

31. Any two: beryllium (Be), magnesium (Mg), strontium (Sr), barium (Ba), radium (Ra).

Lesson Check Answers

32. The composition of matter always changes during a chemical change.

33. a transfer of energy, a change in color, the production of a gas, the formation of a precipitate

34. The mass of the products is always equal to the mass of the reactants.

35. In a physical change, the chemical composition of a substance does not change. In a chemical change, the chemical composition of the reactants changes as one or more products form.

36. **a.** physical **c.** chemical
b. physical **d.** chemical

37. Mass is conserved in every physical change or chemical reaction.

38. 43.2 g

38. This relates to the Law of Conservation of Mass, stating that the mass of the reactants (Hydrogen and oxygen) will equal the mass of the product(s) [water in this case].

4.8 g Hydrogen + 38.4 g Oxygen → 43.2 g H_2O