Name _____ Date _____ Class _____

3–1 Review and Reinforcement

Early Models of the Atom

On the line at the left, write the letter of the chemist who proposed each of the ideas listed below. Each letter may be used once, more than once, or not at all.

a. Democritus b. Lavoisier c. Proust d. Dalton

_____ 1. Matter is neither created nor destroyed in chemical reactions.

_____ 2. A given compound always has the same relative numbers and kinds of atoms.

_____ 3. All atoms of a given element are identical, but they differ from those of any other element.

_____ 4. A given compound always contains the same elements in the same proportions by mass.

_____ 5. Each element is composed of extremely small particles called atoms.

_____ 6. All matter is composed of tiny, indivisible particles.

_____ 7. Atoms are neither created nor destroyed in chemical reactions.

If the statement is true, write "true." If it is false, change the underlined word or words to make the statement true. Write your answer on the line provided.

_____ 8. There are about <u>5000</u> elements, which combine to form the vast number of different substances in the world around us.

_____ 9. It is possible to actually "see" atoms using a <u>scanning tunneling microscope</u>.

_____ 10. The <u>submicroscopic</u> world of the atom includes exotic particles called quarks and gluons.

_____ 11. Like other well-known Greek philosophers of the time, Aristotle <u>agreed</u> with Democritus' ideas about atoms.

_____ 12. The study of atoms has led to technological advances such as <u>television and computers</u>.

Answer each of the following questions in the space provided.

13. What definition of the atom is accepted by scientists today?

_____

_____

_____

_____

_____

3–1 Review and Reinforcement (continued)

14. What important contribution did Lavoisier make to Dalton's atomic theory of matter?

15. Why is it not necessarily true that "100% natural" products are superior to those made in a laboratory?

16. What would Proust say about the composition of all carbon dioxide (CO_2) molecules?

Name _____ Date _____ Class _____

3–2 Review and Reinforcement

Discovering Atomic Structure

On the line at the left, write the letter of the answer that best completes each statement.

_____ 1. The scientist who suggested that the structure of the atom was somehow related to electricity was
   a. Benjamin Franklin.
   b. Democritus.
   c. Michael Faraday.
   d. John Dalton.

_____ 2. The negatively charged electrode of a cathode ray tube is the
   a. anode.
   b. cathode.
   c. plate.
   d. magnet.

_____ 3. The physicist Henri Becquerel discovered radioactivity while working with a sample of
   a. radium.
   b. silicon.
   c. curium.
   d. uranium.

_____ 4. Which of the following is not a component of the radiation emitted by a radioactive sample?
   a. alpha radiation
   b. delta radiation
   c. gamma radiation
   d. beta radiation

_____ 5. Rutherford's alpha-scattering experiment showed that the charge on the nucleus of the atom must be
   a. positive.
   b. neutral.
   c. negative.
   d. too small to be detected.

_____ 6. In his experiments with cathode ray tubes, Thomson concluded that cathode rays were composed of particles that were
   a. positively charged.
   b. heavy.
   c. negatively charged.
   d. visible.

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3–2 *Review and Reinforcement (continued)*

On the line at the left, write the term from the list that matches each description below.

electron	cathode ray
alpha particle	radioactivity
coulomb	atomic nucleus
gamma radiation	static electricity

_____ 7. electrical charges that are not in motion

_____ 8. stream of particles originating from a cathode

_____ 9. SI unit of electrical charge; charge of one electron

_____ 10. spontaneous emission of radiation from an element

_____ 11. negatively charged particle found outside the atomic nucleus

_____ 12. radiation that is similar to X-rays and is not composed of particle

_____ 13. small core at the center of an atom containing a positive charge

_____ 14. particle with a 2+ charge that is emitted by radioactive elements

Answer each of the following questions in the space provided.

15. How did Rutherford's alpha-scattering experiment show that Thomson's plum pudding model of the atom was incorrect?

16. Draw and label a diagram of Rutherford's atomic model. How does it differ from Thomson's model?

17. What was the purpose of Millikan's oil drop experiment?