Chapter 4  Atomic Structure

Section 4.1 Studying Atoms
(pages 100–105)

This section discusses the development of atomic models.

Reading Strategy (page 100)

Summarizing  As you read, complete the table about atomic models. For more information on this Reading Strategy, see the Reading and Study Skills in the Skills and Reference Handbook at the end of your textbook.

<table>
<thead>
<tr>
<th>Atomic Models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scientist</strong></td>
</tr>
<tr>
<td>Dalton</td>
</tr>
<tr>
<td>Deflected beam</td>
</tr>
<tr>
<td>Deflection of alpha particles passing through gold foil</td>
</tr>
</tbody>
</table>

Ancient Greek Models of Atoms (page 100)

1. Democritus named the smallest particles of matter _________ because they could not be divided.

Dalton’s Atomic Theory (page 101)

2. Is the following sentence true or false? John Dalton gathered evidence for the existence of atoms by measuring the masses of elements that reacted to form compounds. _____________

3. Dalton’s theory suggests that all matter is made up of individual particles called _____________, which cannot be _____________.

4. Circle the letters of the sentences that represent main points of Dalton’s theory of atoms.
   a. All elements are composed of atoms.
   b. In a particular compound, atoms of different elements always combine the same way.
   c. All atoms have the same mass.
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Thomson’s Model of the Atom (pages 102–103)
5. Use the words in the box below to fill in the blanks. Objects with like electric charges _________, and objects with opposite electric charges _________.

<table>
<thead>
<tr>
<th>attract</th>
<th>deflect</th>
</tr>
</thead>
<tbody>
<tr>
<td>reflect</td>
<td>repel</td>
</tr>
</tbody>
</table>

6. Thomson concluded that the particles in the glowing beam had a(n) _________ charge because they were attracted to a positive plate.

7. Circle the letter of the sentences that describe Thomson’s model of the atom.
   a. An atom is filled with positive matter.
   b. An atom is mostly space with a small nucleus.
   c. Negative charges are scattered throughout an atom.

Rutherford’s Atomic Theory (pages 104–105)
8. An _________ is a fast-moving particle that carries a positive charge.

9. Circle the letters of the sentences that describe what happened when Marsden directed a beam of particles at a piece of gold foil.
   a. More alpha particles were deflected than expected.
   b. None of the alpha particles were deflected.
   c. Some alpha particles bounced back toward the source.

10. Circle the letter of the sentence that states what Rutherford concluded from the gold foil experiment.
   a. An atom’s negative charge is concentrated in its nucleus.
   b. An atom’s positive charge is concentrated in its nucleus.
   c. An atom’s positive charge is spread evenly throughout the atom.