Chapter 8: Lesson 2- Physical and Chemical Properties of Matter

Assess Your Understanding

Why Are Chemical and Physical Properties Useful?

1. **EXPLAIN:** Why can chemical and physical properties be used to classify matter?

2. **ANSWER:** What are the properties of matter?

Key Concept Summary

**Why Are Chemical and Physical Properties Useful?**

- Matter can have many different properties, or characteristics. Hardness, texture, flammability, and color are all examples of properties of matter. Characteristic properties of matter can be used to identify unknown substances. Density, magnetism, melting and boiling points, and the ability to conduct heat or electricity are some properties that hold true, independent of the amount of the sample. The amount of matter does not change the characteristic physical and chemical properties of the matter.

- Some properties of matter can’t be seen or identified just by observation or touch. A **chemical property** is a characteristic of a substance that describes its ability to change into different substances. Like physical properties, chemical properties are used to classify substances. The ability to burn is a chemical property, as is the tendency to rust.

3. Explain the basic difference between a substance’s physical and chemical properties, as well as how both are useful to scientists.
Lesson 8.2

**Understanding Main Ideas**

4. What two facts about characteristic chemical and physical properties make it possible for scientists to compare and classify matter?

5. What are some of the physical properties of a piece of wood?

6. What is a chemical property of a piece of wood?

**Building Vocabulary**

Write a definition for each of these terms on the lines below.

7. Physical property:

8. Chemical property:
### Properties of Iron, Gold, and Silver

<table>
<thead>
<tr>
<th>Property</th>
<th>Iron</th>
<th>Gold</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>can be soft or hard</td>
<td>soft</td>
<td>soft</td>
</tr>
<tr>
<td>Luster</td>
<td>shiny</td>
<td>shiny</td>
<td>shiny</td>
</tr>
<tr>
<td>Thermal conductor</td>
<td>yes</td>
<td>yes</td>
<td>highest known conductivity of all metals</td>
</tr>
<tr>
<td>Electrical conductor</td>
<td>yes</td>
<td>yes</td>
<td>highest known conductivity of all metals</td>
</tr>
<tr>
<td>Attracted by magnet</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Ductility</td>
<td>moderate</td>
<td>high</td>
<td>high</td>
</tr>
<tr>
<td>Malleability</td>
<td>yes</td>
<td>extremely malleable</td>
<td>yes</td>
</tr>
<tr>
<td>Color</td>
<td>silver-gray</td>
<td>yellow</td>
<td>brilliant white</td>
</tr>
<tr>
<td>Boiling point</td>
<td>3000°C</td>
<td>2807°C</td>
<td>2212°C</td>
</tr>
<tr>
<td>Melting point</td>
<td>1538°C</td>
<td>1064.43°C</td>
<td>960.8°C</td>
</tr>
</tbody>
</table>

9. Which metal shown in the table would be the best choice as a material for a tool? Explain.

10. Why do you think silver and gold—but not iron—have been used extensively throughout history to make jewelry and coins?

11. You have made observations about the properties of a metal sample. It is soft, shiny, malleable, conducts thermal energy and electricity, and has not melted at 1200°C. Of the metals in the table, which one could the sample possibly be?
Lesson Quiz

If the statement is true, write true. If the statement is false, change the underlined word or words to make the statement true.

12. ______________ Characteristic chemical and physical properties for a given substance sometimes change.

13. ______________ Some properties of matter cannot be seen or identified just by observation or touch.

14. ______________ You can use characteristic chemical and physical properties to compare and classify matter.

15. ______________ Examples of chemical properties include ability to attract a magnet and the ability to dissolve in water.

16. ______________ The amount of matter in an object or a sample of a substance changes its characteristic physical and chemical properties.

Fill in the blank to complete each statement.

17. Hardness, texture, flammability, and color are all examples of properties of ________________.

18. A(n) ______________ property is a characteristic of a substance that can be observed without changing it into another substance.

19. Matter can have many different ________________, or characteristics.

20. A(n) ______________ property is a characteristic of a substance that describes its ability to change into different substances.

21. The ability to burn is a ________________ property.