

What Do You Remember?

1. Copy and complete the following table in your notebook. (7.1) **K/U**

Chemical name	Chemical formula	Atom? Y/N	Molecule? Y/N	Element? Y/N	Compound? Y/N	Total number of atoms
sulfur dioxide	SO ₂					
	Cl ₂					
	H ₂ O ₂					
	Si					
carbon dioxide						
butane	C ₄ H ₁₀					
cholesterol	C ₂₇ H ₄₆ O					
	O ₃					

2. (a) Explain what is meant by the term “di atomic.”
 (b) Write the formulas of seven diatomic elements. (7.1) **K/U**
3. When each of the following elements combine, what type of compound, ionic or molecular, forms? (7.3) **K/U**
- (a) potassium and fluorine
 (b) iron and chlorine
 (c) nitrogen and oxygen
4. Identify the colourless gas that produced the following result when tested: (7.5) **K/U**
- (a) turned the limewater cloudy
 (b) produced a popping sound when a blazing wooden splint was held near it
 (c) reignited a glowing wooden splint
5. Explain the difference between a molecular element and a molecular compound. (7.1) **K/U**
6. How do ionic compounds form? (7.1) **K/U**
7. Which types of elements combine to form molecules? (7.3) **K/U**
8. Which types of elements combine to form ionic compounds? (7.3) **K/U**

What Do You Understand?

9. When iron combines with oxygen, there are two possible iron oxide compounds that form. One compound contains one atom of iron to each atom of oxygen, and the other compound contains two atoms of iron to every three atoms of oxygen. Write a chemical formula for each compound. (7.1) **K/U**
10. When a sample of white crystals is heated, a colourless gas is produced that relights a glowing splint. How can you determine from this observation whether the sample of white crystals is an element or a compound? Explain your answer. (7.6) **K/U**
11. The wildlife in a northern Canadian community has been found to contain high levels of toxic chemicals even though the chemicals are not used in this geographical region. (7.8) **A C**
- (a) Write to a resident of this community explaining what the source of the chemicals is and why the levels are unacceptably high in the community’s food supply.
- (b) What properties of these toxic chemicals make them particularly dangerous and cause them to spread globally and through the food chain?

Solve a Problem

- Solutions of ionic compounds can conduct electricity, while solutions of molecular compounds often do not. Design a method of identifying a white powder that may be either the simple sugar glucose ($C_6H_{12}O_6$) or the highly poisonous sodium cyanide ($NaCN$). Include all required safety procedures. (7.1) **T/I**
- Use your knowledge about the properties of everyday substances to design a method to safely distinguish among three white powders—chalk dust, icing sugar, and baking soda. Use a variety of physical properties. Include all of the necessary safety precautions. (7.1, 7.3) **T/I**
- Carbonated drinks contain dissolved carbon dioxide that is released when the bottle or can is opened. Design a method of collecting and testing the gas to verify its identity. Include all necessary safety precautions. Perform your experiment with your teacher's approval and report your results. (7.5) **T/I C**

Create and Evaluate

- The natural gas that your Bunsen burner uses in the laboratory consists mostly of methane. Its chemical formula is CH_4 . When this gas burns, it reacts with oxygen (O_2), and produces water (H_2O) and carbon dioxide (CO_2). (7.4) **T/I A C**
 - Using your choice of items to represent atoms (e.g., modelling clay), connect them with toothpicks to make one molecule of CH_4 and two molecules of O_2 .
 - Break apart the molecules you made in part (a) and rearrange them to make new molecules of H_2O and CO_2 . How many of each molecule do you get?
 - Consider a situation where the supply of air is limited, such as using a barbecue indoors. Explain why the deadly gas carbon monoxide (CO) is produced instead of carbon dioxide (CO_2).

- When an electric current is passed through water, two colourless gases are produced. When hydrogen gas makes a popping sound in the presence of a blazing splint, water is produced. Explain how each of these reactions demonstrates that water is a compound, not an element. (7.6) **K/U**

Reflect on Your Learning

- Many chemicals, such as plastics and pesticides, impact our lives in beneficial as well as harmful ways. Reflect on the impact of oxygen in our lives. The same chemical reaction that causes oxygen to rust the iron in our cars is also needed for the iron in our blood to carry oxygen to all our cells. Join a small group of students and share your ideas about a planet with an atmospheric oxygen level much lower or much higher than the current 20 %. How would our planet and our lives be different? **A C**
- Consider a typical day in your school week. Estimate the number of plastic or other non-biodegradable items that you use. Compare this estimate to the number of biodegradable or reusable items that you use. Why would it be good for the environment to change this ratio? How can you change your daily habits to make these changes? **A C**

Web Connections

- Research and report on the history of iodizing table salt. (7.1) **T/I C**
- Research the process and risks of body piercing. Develop a list of questions to ask the body piercer before having a piercing done. (7.3) **T/I C**
- Research and report on the major concerns about the unregulated use of nanotechnology. **T/I A C**



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