

Objectives:

1.

2.

3.

4.

5. Define Chemical Bond:

6. **Explain** why it is more difficult to separate the elements of a compound than the substances in a mixture. (p109)

7. **Write** the numbers and kinds of elements contained in the following compounds:

a. NaCl: **Example** 1-Na and 1-Cl

b. CO₂

c. KBr

d. NH₃

e. MgO

8. **Describe** the difference between a ball-and-stick model (fig 4-3) and a space-filling model (fig 4-4) of a compound. Sketch the two diagrams. (p110 -111)

9. **Explain** why a substance with a network structure has a high melting point. (p111 and 112)

10. Copy Table 4-1 and Table 4-2.

- a. Which one represents network structures? Which one represents molecular structure? What evidence do you have to support your decision?

11. **Contrast** the structure of table salt and table sugar.

12. **Predict** whether a compound with a boiling point of 68°C is likely to be a network solid or in the form of individual molecules. See question 10.

13. Define the following:

- a. Chemical structure
- b. Bond Length
- c. Bond Angle

WORKSHEET

4.1 ENRICHMENT WORKSHEET

**Connection to
FINE ARTS**

What Happens in a Kiln?

Read the following paragraph, study the diagram, and complete the exercises below.

After a potter makes a bowl, mug, or other such object out of wet clay on a potter’s wheel, he or she must dry the object and then bake it in an extremely hot oven, called a *kiln*, to strengthen it. Otherwise, the clay will not hold together when the object gets wet. A similar process is used to make bricks and porcelain from clay. The temperature reached in the kiln is one factor that affects the final product, as shown in the table below.

Step	Temperature (°C)	Characteristics	Material completed
1	50–200	Remaining water evaporates from clay, but clay particles are not joined together	Dried clay
2	900–1000	Some chemical bonds form; clay will not break down if exposed to water	Bricks
3	1000–1100	More chemical bonds form	Terra-cotta pottery
4	1300–1400	Clay is extremely hard, durable, and waterproof	Porcelain

Exercises

- Suppose your school has a kiln that can fire clay at temperatures up to 1000°C. Could you make porcelain in this kiln? Why or why not?

- Using the table above, explain why an object made of clay would lose its shape upon contact with water if it were not fired in a kiln.

- Which type of clay is probably more durable, terra cotta or porcelain? Why?

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