

## Chemistry I Unit 4 Practice Test

**For the following pairs of elements, tell whether they will form an ionic compound, a molecular compound or no compound at all. Explain your answer. If they will form an ionic compound, write the name and formula for the compound that it will form. Try to answer these without your polyatomic ion handout.**

1. sulfur and fluorine
2. iron (II) and bromine
3. magnesium and oxygen
4. barium and sodium
5. hydrogen and calcium
6. potassium and nitrogen
7. lithium and the sulfate ion
8. silver and chlorine
9. ammonium and chlorine
10. strontium and phosphorus
11. manganese (IV) and the sulfite ion
12. zinc and fluorine

**13.** Describe how the following bonds are formed. Describe the unique physical properties that each of these types of bonds give each of these substances. Explain how these bonds contribute to the properties that you have described.

### ionic bonds    metallic bonds

14. Explain why solutions of ionic compounds will conduct electricity, but ionic solids will not conduct electricity.
15. Explain why metals are good conductors of electricity. Include a description of metallic bonding in your discussion.
16. Explain why molecular compounds will not conduct electricity either as solids or in solutions.

**Write the names of the following chemical compounds:**

17.  $\text{H}_2\text{O}$
18.  $\text{N}_2\text{O}_5$
19.  $\text{SO}_2$
20.  $\text{HC}_2\text{H}_3\text{O}_2$
21.  $\text{NO}_3$
22.  $\text{V}_2\text{O}_5$
23.  $\text{PH}_3$
24.  $\text{CS}_2$

**25.** Write the names, formulas and charges of all 17 polyatomic ions that you learned from memory.

**25.** One of the ions of iron is iron(III).

- a. How many protons and electrons does this ion have?
- b. Write the formula for the compound that is formed with iron and sodium.
- c. Write the formula for the compound that is formed with iron and aluminum.

**26.** Explain why chemical compounds have very different physical and chemical properties than the individual elements from which they are formed.

**27.** Explain why distilled water is a very poor conductor in the laboratory.

**28.** What conclusions can you make about the following observations? Explain your answer.

- a. Water from the tap is a conductor of electricity.
- b. Vegetable oil will not conduct electricity at all.
- c. Soy sauce will conduct electricity.
- d. You should not run your hair dryer while you are taking a bath.
- e. Plastic is used to insulate electric wires.

**29.** Explain the difference between an atom, a molecule and an ion.