

Name: \_\_\_\_\_ Class/Period: \_\_\_\_\_

## Chemistry Quiz 5

### Part 1: Valence Electrons

Write the name of each of the following elements, and add the correct number of electron dots to each element's symbol.

|     |     |     |     |      |
|-----|-----|-----|-----|------|
| F   | Al  | Ge  | Rn  | Ca   |
| 1.) | 2.) | 3.) | 4.) | 5.)  |
| Si  | O   | He  | B   | Sn   |
| 6.) | 7.) | 8.) | 9.) | 10.) |

Write the correct chemical symbol and the charge of the ion that is formed from each of these elements.

Examples: boron  $B^{3+}$  silver  $Ag^+$

- 11.) hydrogen \_\_\_\_\_ 12.) chlorine \_\_\_\_\_ 13.) beryllium \_\_\_\_\_ 14.) antimony \_\_\_\_\_  
15.) cobalt \_\_\_\_\_ 16.) gallium \_\_\_\_\_ 17.) potassium \_\_\_\_\_ 18.) phosphorus \_\_\_\_\_

### Part 2: Ionic Bonding

Predict the compound that will be formed by each pair of elements. Make sure that the compound follows the Rule of Eight and the Rule of Zero Charge.

Examples: sodium + chlorine  $NaCl$  aluminum + oxygen  $Al_2O_3$

- 19.) lithium + oxygen \_\_\_\_\_ 20.) magnesium + chlorine \_\_\_\_\_  
21.) aluminum + fluorine \_\_\_\_\_ 22.) potassium + nitrogen \_\_\_\_\_  
23.) calcium + oxygen \_\_\_\_\_ 24.) rubidium + bromine \_\_\_\_\_

### Part 3: Covalent Bonding

Draw the Lewis dot structure OR the structural formula for each of the following compounds. Make sure that your compound obeys the Rule of Eight.

25.) carbon tetrafluoride,  $CF_4$

26.) methanol,  $CH_3OH$

27.) hydrazine,  $N_2H_4$

28.) chloropentane,  $C_5H_{11}Cl$

29.) methylamine,  $CH_3NH_2$

30.) ethene,  $C_2H_6$

31.) acetone,  $CH_3COCH_3$

32.) carbon dioxide,  $CO_2$

*Part 4: Identifying Bonding Types*

Aeryn and Bob are investigating a new set of chemical compounds in the laboratory. Use the evidence listed for each compound to decide whether it has ionic, covalent, or metallic bonding.

33.) Aeryn reacted calcium with phosphorus in the presence of oxygen. The resulting substance is a brittle white crystal.

Circle one:      COVALENT                  IONIC                  METALLIC

34.) Bob reacts bromine with chlorine to form a brownish-yellow gas. It turns into a liquid at  $5^\circ C$  and freezes at  $-54^\circ C$ .

Circle one:      COVALENT                  IONIC                  METALLIC

35.) Aeryn heats a mixture of gallium, indium and tin. They bond together to form a dense, silvery substance that is liquid at room temperature. The liquid conducts electricity and does not dissolve in water. It freezes at  $-19^\circ C$  and becomes a soft, malleable solid.

Circle one:      COVALENT                  IONIC                  METALLIC

36.) Bob reacts lithium with water. The lithium fizzes, bubbles, and then disappears into the water, forming a clear solution. When the water is evaporated, white crystals form at the bottom of the beaker.

Circle one:      IONIC                  COVALENT                  METALLIC

37.) Aeryn heats germanium in the presence of oxygen. The result is a white powder that does not dissolve in water. When melted, it does not conduct electricity.

Circle one:      IONIC                  COVALENT                  METALLIC