Name: _____

# Honors Chapter 7 and 9 Practice Worksheet

## Chapter 7

1. What is an ionic bond?
2. What are 5 properties of ionic compounds?
3. What charge do the following elements have when they form ions?

a. Mg b. Cl c. N

4. Draw the electron dot structure for the following atoms.

a. P b. He c. Si

5. What is a cation and how is it formed?
6. What type of elements form cations?
7. What is an anion and how is it formed?
8. What type of elements form anions?
9. Write the electron configuration for the IONS of the following elements.

a. Br b. Na c. $V^{+5}$

10. What is a metallic bond?
11. What is the sea of electrons and what properties of metals does it explain?
12. What is a crystal?
13. What is coordination number?
14. What is the difference in a substitutional and an interstitial alloy? (Draw a picture of each.)

## Chapter 9

15. How do you name a cation?
16. How do you name an anion?
17. Color code the following periodic table to show the locations of the regular metals and the transition metals. Make sure to use two different colors and indicate what the colors mean. **I will give you one to color**.
18. When using the old naming system, what do the ending -ic and -ous mean?
19. Name the following compounds.

a. $Al_2O_3$
b. $PbCl_4$
c. $(NH_4)_2O$

d. $Cu_2(SO_4)$ (old name)
e. $LiC_2H_3O_2$

20. Write the formulas for the following compounds.

a. aluminum chlorate
b. magnesium chloride
c. tin (IV) bromide
d. silver (I) nitrite
e. ammonium carbonate
f. cupric chloride

**Additional Exercises**

21. Atoms of an element, X, have the electronic configuration shown below. The compound most likely formed with magnesium, is …

$1s^2 2s^2 2p^6 3s^2 3p^3$

a. MgX
b. $Mg_2X$
c. $MgX_2$
d. $MgX_3$
e. $Mg_3X_2$

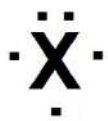
22. Which of the following represents the ground-state configuration of a negative ion of a halogen?

a. $1s^2 2s^2 2p^5 3s^2 3p^5$
b. $1s^2 2s^2 2p^6 3s^2 3p^6$
c. $1s^2 2s^2 2p^6 2d^{10} 3s^2 3p^6$
d. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$
e. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$

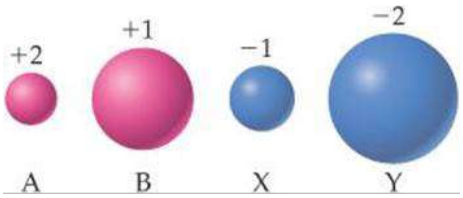
23. Which of the following represents the ground-state configuration of a common ion of an alkaline earth element?

a. $1s^2 2s^2 2p^5 3s^2 3p^5$
b. $1s^2 2s^2 2p^6 3s^2 3p^6$
c. $1s^2 2s^2 2p^6 2d^{10} 3s^2 3p^6$
d. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$
e. $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$

24. For each of these Lewis symbols, indicate the group in the periodic table in which the element X belongs:

a. 
b. 
c. 

25. Illustrated below are four ions – A, B, X, and Y – showing their relative ionic radii.

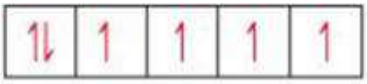



a. Which combinations of these ions produce ionic compounds where there is a 1:1 ratio of cations and anions?

b. Among those compounds from part a, which combination of ions leads to the ionic compound having the largest lattice energy?

c. Which combination of ions leads to the ionic compound having the smallest lattice energy?

26. The orbital diagram below shows the valence electrons for a 2+ ion of an element.



*4d*

a. What is the element?

b. What is the electron configuration of an atom of this element?

27. a. Does the lattice energy of an ionic solid increase or decrease (i) as the charges of the ions increase, (ii) as the sizes of the ions increase?

b. List the following substances in order from lowest lattice energy to the highest: ScN, KBr, MgO, NaF.

28. The $Ti^{2+}$ ions is isoelectronic (same number of electrons) with the Ca atom.

a. Are there any differences in the electron configurations of $Ti^{2+}$ and Ca?

b. Will Ca and $Ti^{2+}$ have the same number of unpaired electrons?

29. Explain the following trends in lattice energy:

a. $CaF_2 > BaF_2$

b. NaCl > RbBr > CsBr

c. BaO > KF

30. Predict the chemical formula of the ionic compound formed between the following pairs of elements:

a. Al and F

b. K and S

c. Y and O (Y = 3+)

d. Mg and N