Name_____ Date_____ Per_____

CH 7 READING GUIDE – Ionic and Metallic Bonding!

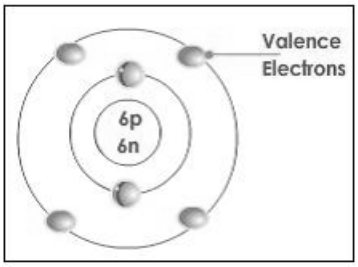
7.1: Ions (p. 194-199)

1) What are **VALENCE ELECTRONS**?_____

_____

2) Fill in the chart below for each element:

Element	# valence e^-	electron dot structure (Lewis Structure)
Rb		
S		
Sr		
Al		
C		
Kr		
P		
I		



$$\text{Formal Charge} = \text{Valence Electrons in Neutral Atom} - \left(\text{Unshared Valence Electrons} + \frac{1}{2}\text{Shared Electrons}\right)$$

3) How many valence electrons do atoms of the noble gases have?_____

4) Why is this number (from previous question) significant?_____

_____

5) How do **CATIONS** form?_____

6) How do **ANIONS** form?_____

7) Atoms of which elements tend to gain electrons?_____

8) Atoms of which elements tend to lose electrons?_____

9) Write the electron configuration ($1s^2 2s^2 \ldots$) for:

- Na:_____
- Na^+:_____
- Br:_____
- Br^-:_____

10) Complete the chart below.

Element	# of valence e^-	gain/lose e^- (how many?)	Ionic charge	metal/nonmetal
Mg				
O				
P				
Br				
Rb				
Ar				
S				
N				
Li				

11) Write the electron configuration for the following. (HINT: These are transition metals! Read the passage on transition metals on page 197 to help you predict the e- config. for the ions!). You may use the abbreviated (noble gas) configuration method if you prefer).

- Cd:_____
- Cd^{2+}:_____
- Ag:_____
- Ag^{+}:_____

7.2: Ionic Bonds and Ionic Compounds (p. 201-207)

12) What is an **IONIC COMPOUND**?_____\

_____

13) Although ionic compounds are composed of ions, ionic compounds are **electrically neutral**…**WHY**?_____

_____

14) What are **IONIC BONDS**?_____

15) What is a **CHEMICAL FORMULA**?_____

16) What is a **FORMULA UNIT**?_____

17) What is the formula unit for **magnesium chloride**?_____**WHY**?_____

_____

18) (HINT: See sample problem 7.1 on page 203) For each ionic compound formed from the following pairs of elements, do the following:

i) Use **electron dot (Lewis) structures** to show the transfer of electrons from one element to the other.
ii) Write the **chemical formula and name of the compound** formed when the 2 elements combine to form an ionic compound.

A) K and Cl

B) Li and N

C) Ca and O

D) Sr and Br

E) Al and S

F) Mg and P

19) Write the correct chemical formula AND name for the compounds formed from each pair of ions below:

A) K^+ and S^{2-}: _____ ; _____

B) Ca^{2+} and N^{3-}: _____ ; _____

C) Na^+ and O^{2-}: _____ ; _____

D) Al^{3+} and Cl^-: _____ ; _____

E) Rb^+ and F^-: _____ ; _____

F) Sr^{2+} and Br^-: _____ ; _____

20) What are three properties of **IONIC COMPOUNDS**?

- _____
- _____
- _____

7.3: Bonding in Metals (p. 209-213)

21) What is a **METALLIC BOND**?_____

22) How does the mobility of valence electrons in metals explain the following properties of metals?

- ●conducts electricity:_____
- ●malleable / ductile:_____

23) What are **ALLOYS**? How are they prepared?_____

_____

24) Why are alloys so important?_____

25) What are the most important alloys today?_____

26) List the principal elements in most steels:_____

_____

27) List some useful properties of steel alloys._____

_____