

Name _____ Date _____ Period _____

Section 4.1

Review your bookwork summary table of properties of elements and compounds (**sodium, carbon, hydrogen, chlorine, oxygen, sodium chloride, carbon dioxide and water**) and study guide 4.1

Expect questions of assigning properties to those substances, such as

_____ freezes at 0 °C; _____ is produced when carbon burns in air; _____ covers about 70% of the earth's surface; _____ is the main constituent of charcoal; _____ is the most abundant element in the earth crust; _____ is the most abundant element in the universe; _____ is the lightest of all elements; _____ is commonly known as table salt; _____ along with silicon makes up sand; _____ is a soft, very reactive metal; _____ is a greenish reactive gas.

Section 4.2

Wordbank

- | | | | |
|----------------|-----------------------|--------------|-------------|
| a) Ionic bond | b) Ionic compound | c) element | d) crystal |
| e) electrolyte | f) compound | h) noble gas | i) molecule |
| n) nonmetallic | o) molecular compound | p) 2 | q) 8 |

- _____ 1. Made from one type of atoms.
- _____ 2. Made from two or more types of atoms chemically combined.
- _____ 3. Element with stable electron configuration.
- _____ 4. The strong attractive force between ions of opposite charge in ionic compounds.
- _____ 5. A regular, repeating arrangement of particles in three dimensions.
- _____ 6. Substance that conducts electricity when melted or in aqueous solution.
- _____ 7. What kind of bond is formed when magnesium atoms react with oxygen atoms?
- _____ 8. What kind of bond is formed when carbon atoms react with oxygen atoms?
- _____ 9. Uncharged group of two or more atoms held together by covalent bonds.
- _____ 10. Most atoms become stable when they have _____ valence electrons.
- _____ 11. Helium is stable with _____ valence electrons.
- _____ 12. Covalent bonds are formed between _____ elements.

_____ 16. How do the properties of the compound magnesium oxide (MgO) compare with the properties of the elements magnesium and oxygen? The compound has _____.

- a) completely different properties from the two elements.
 b) the same properties as the two elements.
 c) similar properties as the two elements.

(compare to NaCl, sodium and chlorine)

17. Determine if the following elements are metals (m) or nonmetals (nm)

- a) K _____ b) S _____ c) C _____ d) Ca _____

18. Would the following pairs of atoms combine chemically to give ionic (**i**) or molecular (**m**) compounds? (*metal + nonmetal or all nonmetals*)

- a) Sr and S _____ b) Cl and F _____ c) Se and F _____ d) Al and Br _____

19. How many electrons would the following elements lose to reach noble gas configuration? (use the periodic table)

- a) Na _____ b) Ba _____ c) Al _____ d) Pb _____

20. Complete the Table (answer choices suggested in parentheses in first column)

	ion	Cation	Anion
Atoms or groups of atoms that have a _____ charge (<i>positive or negative</i>)			
Formed by (<i>losing and/or gaining electrons</i>)			
Which Elements (<i>nonmetals and/or metals</i>)			

Place a *T* for true or an *F* for false on the blank for each of the following statements. Change the underlined word or phrase in each false statement to make it true. Write your correction on the blank.

_____ 21. Covalent compounds tend to be brittle.

_____ 22. Ionic bonds involve electrons shared between two atoms.

_____ 23. In general, ionic compounds are less likely to dissolve in water than covalent compounds.

_____ 24. Methanol (CH₄O) is an example of a covalent compound.

_____ 25. A covalent compound is composed of electrically charged atoms.

_____ 26. Elements form compounds to achieve noble gas configuration.

_____ 27. To form a neutral ionic compound, Mg²⁺ combines with Cl⁻ in a 1:1 ratio.

28. Describe the significant physical and chemical properties of noble gases and the reason for their stability.

29a) Describe the octet rule _____

b) Why is helium stable with only 2 valence electrons? _____

30. Describe the two ways in which atoms achieve stable noble gas configuration (*ionic or covalent*)

31. Draw the electron dot structures for following molecular compounds and diatomic elements

a) F_2

b) NCl_3

c) N_2

d) N_2H_4

e) C_2F_2

f) C_2H_4

32. Comparing Ionic and Molecular Compounds

Complete the Table (answer choices suggested in *italic* in first column)

Characteristics	Ionic Compound	Molecular Compound
From element types <i>metals + nonmetals,</i> <i>or all nonmetals</i>		
Composed of <i>ions,</i> <i>or molecule</i>		
Formed by _____ electrons <i>sharing,</i> <i>or gaining and losing</i>		
Type of bonds <i>ionic,</i> <i>or covalent</i>		
Melting points usually <i>low,</i> <i>or high</i>		
Physical state at room temp. <i>solid,</i> <i>or gas, liquid or solid</i>		
Conducts electricity <i>usually not, or</i> <i>only when melted or dissolved in water</i>		

33. Why would you never expect to find Na_2Cl as a stable compound? (charges....)

34. How many protons, total electrons, and valence electrons does each have:

- a) sodium atom: _____ protons _____ electrons and _____ valence electrons
- b) neon atom _____ protons _____ electrons and _____ valence electrons
- c) sodium cation _____ protons _____ electrons and _____ valence electrons

35. What are three general properties of ionic compounds?

36. What are three general properties of molecular compounds?