

Name: \_\_\_\_\_

## Honors Chemistry Unit 3 Study Guide (Chapter 7, 8, and 9)

**\*Chapter 7:** \*\*Study all vocabulary for Chapter 7!\*\*

- What is the charge when the following elements form ions?
  - Br
  - Ar
  - Si
- How many valence electrons do the following elements have?
  - Be
  - He
  - N
- Draw the Lewis dot structure for the following elements.
  - Ne
  - Sr
  - I
- What types of elements tend to form cations?
- What types of elements tend to form anions?
- What happens to a phosphorus atom in order to achieve noble gas configuration?
- What types of elements form ionic bonds?
- Write the formulas and names for compounds formed by the following elements.
  - fluorine and calcium
  - aluminum and sulfur
- Write the electron configuration for the **IONS** of the following elements.
  - nitrogen
  - iron (+3)
  - beryllium
- Which of the following represents the ground-state configuration of a negative ion of a halogen?
  - $1s^2 2s^2 2p^5 3s^2 3p^5$
  - $1s^2 2s^2 2p^6 3s^2 3p^6$
  - $1s^2 2s^2 2p^6 2d^{10} 3s^2 3p^6$
  - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$
  - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$

**\*Chapter 8:** \*\*Study all vocabulary for Chapter 8!\*\*

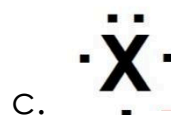
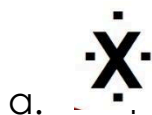
- What is the difference between an ionic bond and a covalent bond?

12. Which compound has the highest bond dissociation energy:  $F_2$ ,  $O_2$ , or  $N_2$ ?
13. What are the 7 naturally existing diatomic elements?
14. What type of elements are likely to form a covalent bond with each other?
15. When water is placed between positive and negative plates, which side of the molecule is attracted to the positive plate?
16. Add Honors Unit 3 Study Guide page 2 here.

- $$\begin{array}{ccccccc} & \text{H} & \text{H} & \text{H} & & \text{H} & \\ & | & | & | & & | & \\ \text{H} & - \text{C} = & \text{C} - & \text{C} - & \text{C} \equiv & \text{C} - & \text{C} - \text{H} \\ & & & | & & & | \\ & & & \text{H} & & & \text{H} \end{array}$$

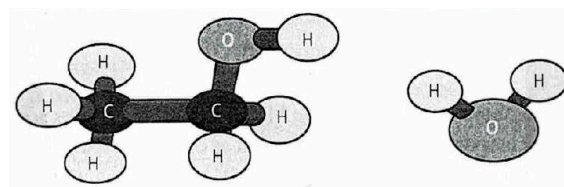
- What is the hybridization at each carbon atom in the molecule?
- How many  $\sigma$  bonds are there in the molecule?
- How many  $\pi$  bonds?

22. Which of the following most directly explains the difference in melting points between BeO (2,507°C) and NaCl (801°C)?
- NaCl is an ionic compound and BeO is a covalent (molecular) compound.
  - There is less distance between the sodium and chloride ions in NaCl compared to the distance between beryllium and oxygen ions in BeO.
  - The sodium ion is larger and less positively charged than the beryllium ion; the chloride ion is larger and less negative charged than the oxygen ion.
  - Beryllium and oxygen have lower atomic numbers than sodium and oxygen, respectively.
23. For each of these Lewis symbols, indicate the group in the periodic table in which the element X belongs:



24. Refer to the diagram below. Intermolecular attraction that occur between ethanol and water include

- Hydrogen bonding only.
- Ionic forces only.
- Dispersion forces only.
- Hydrogen bonding and dispersion forces.



**\*Chapter 9: \*\*Study all vocabulary for Chapter 9!\*\***

- How do you name a compound that starts with a regular metal?
- What do you add to the name of a compound that starts with a transition metal?

27. What does a roman numeral represent?
28. What does the ending -ic and -ous mean in the old naming system for transition metals?
29. What do you add to the name for a compound that starts with a nonmetal?
30. When do you use the prefix hydro- for an acid?
31. What is the ending of an acid that has a polyatomic ion that ends in -ite?
32. Do you need to balance charges when you are writing the formula for a compound with prefixes in the name?

\*\*Name the following compounds.

- |   |                                  |
|---|----------------------------------|
| 33. $\text{BrF}_5$                                | 38. $\text{N}_2\text{O}$         |
| 34. $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2$ | 39. $\text{AuCl}_3$              |
| 35. $\text{CuSO}_3$ (old name)                    | 40. $\text{H}_2\text{SO}_3$      |
| 36. $\text{HBr}$                                  | 41. $(\text{NH}_4)_2\text{CO}_3$ |
| 37. $\text{Al}_2(\text{SO}_4)_3$                  | 42. $\text{H}_2\text{CO}_3$      |

\*\*Write the formulas for the following compounds.

- |                              |                          |
|------------------------------|--------------------------|
| 43. chromium (III) chloride  | 47. chlorous acid        |
| 44. tetraphosphorus decoxide | 48. ammonium phosphate   |
| 45. perchloric acid          | 49. ferric chloride      |
| 46. potassium chromate       | 50. carbon tetrachloride |

