

Unit 4 Review Worksheet - Accel. Chemistry

Name: Key Pd: _____

1. Identify the following as a property of an ionic bond/compound or a covalent bond/compound:

Property	Ionic?	Covalent?
High melting point & boiling point	X	
Attraction between oppositely charged particles	X	
Formed by sharing electrons		X
Formula must have balanced charges	X	
Formed between a metal and a nonmetal	X	
Has bonding and unshared (lone) electron pairs		X
Formed between nonmetals		X
Conducts electricity when dissolved in water	X	
Usually solids at room temperature	X	
Generally liquids or solids at room temperature	X	
Lewis structures can be used to show how particles are put together		X

2. Answer the following questions about the formation of the oxygen ion:

- Write the ground state electron configuration for oxygen: $1s^2 2s^2 2p^4$
- Does oxygen gain or lose electrons to form an ion? gain How many? 2
- When the oxygen ion is formed, it has the electron configuration of which noble gas? Neon
- Is the oxygen ion a cation or an anion? anion How do you know? negative charge
- What is the name of the oxygen ion? oxide ion
- What is the formula of the compound formed by the sodium ion and the oxygen ion? Na_2O

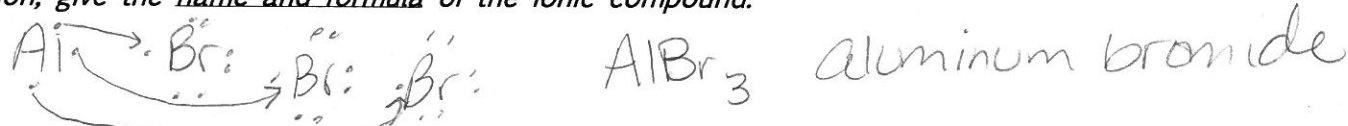
3. Name the following compounds:

- | | |
|---------------------------------------|-----------------------------------------|
| 1. FeO <u>iron (II) oxide</u> | 5. K_2CO_3 <u>potassium carbonate</u> |
| 2. Al_2O_3 <u>aluminum oxide</u> | 6. CO <u>Carbon monoxide</u> |
| 3. XeF_4 <u>xenon tetrafluoride</u> | 7. CaI_2 <u>calcium iodide</u> |
| 4. PbS_2 <u>lead (II) sulfide</u> | 8. AsH_3 <u>arsenic trihydride</u> |

4. Write the formula for each of the following compounds:

- | | |
|------------------------------------------------------|-----------------------------------------------------|
| 1. magnesium oxide <u>MgO</u> | 5. Aluminum fluoride <u>AlF_3</u> |
| 2. ammonium sulfate <u>$(NH_4)_2SO_4$</u> | 6. Iron (II) nitrate <u>$Fe(NO_3)_2$</u> |
| 3. sulfur hexafluoride <u>SF_6</u> | 7. dibromine monoxide <u>Br_2O</u> |
| 4. calcium oxide <u>CaO</u> | 8. phosphorus trihydride <u>PH_3</u> |

5. Use electron dot structures to show how aluminum and bromine combine to form an ionic compound. In addition, give the name and formula of the ionic compound.



6. Describe the differences between a single, double, and triple covalent bond.

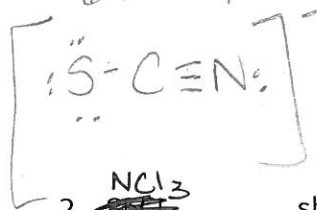
Single is 1 pair of e^- shared, double is 2 pairs e^- shared, + triple is 3 pairs e^- shared

7. Identify the following bonds as nonpolar covalent, polar covalent, or ionic.

- | | | |
|---------------------------------------------|----------------------------------|-----------------------|
| 1. C-H <u>nonpolar</u>
2.55 2.2
(.35) | 2. N-F <u>polar</u>
3.04 3.98 | 3. Na-Cl <u>ionic</u> |
|---------------------------------------------|----------------------------------|-----------------------|

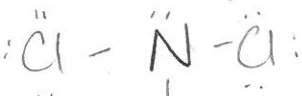
8. Draw Lewis Structures for the following molecules or ions, identify the shape, & determine if the molecule is nonpolar or polar. Include an explanation for the molecular polarity.

1. SCN⁻ shape: linear molecular polarity: polar



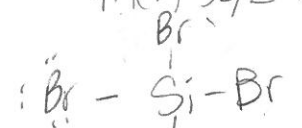
asymmetrical

2. ~~SCN~~ NCl₃ shape: trigonal pyramidal molecular polarity: polar

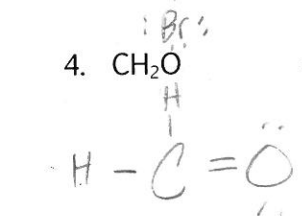


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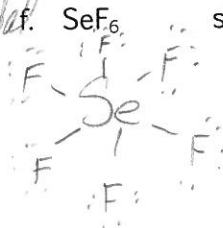
3. SiBr₄ shape: tetrahedral molecular polarity: nonpolar



4. CH₂O shape: trigonal planar molecular polarity: polar



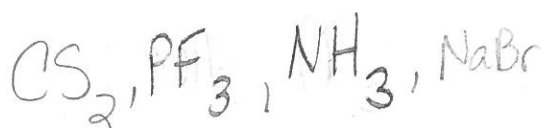
5. KrF₂ shape: trigonal bipyramidal SeF₆ shape: octahedral



9. Which of the following has a higher boiling point? H₂, N₂, Br₂, F₂ Why?

Br₂ because it has a higher mass since they all are LDF

10. List the following in order of increasing melting point: CS₂, NaBr, NH₃, PF₃ — dipole-dipole



LDF (12(2)/32)=76, ionic, H bond