

AR Chemistry Finals Review Set 1

Use the following “periodic table” for the first 36 elements to answer questions 1-6

H																	He
Li	Be											B		N		F	
	Mg											Al	Si		S	Cl	Ar
K			Ti					Fe					Ge	As	Se	Br	

1. Name one element that:

- is a halogen
- is an alkaline earth metal
- is a noble gas
- is an alkali metal
- has one valence electron
- has three valence electrons
- is a transition metal
- gives electrons away in chemical reactions
- can take electrons in a chemical reaction
- is a semimetal
- has 7 valence electrons

2. What type of bonding would you expect between elements

- H and Se
- Fe and Cl
- S and Cl
- Ge and Cl

3. Which element in the table above has the greatest:

- ionization energy
- electronegativity
- atomic size
- ionic size

4. Which will be larger?

- element Mg or its ion?
- element Cl or its ion?
- element K or element Br?
- K's ion or Br's ion?

5. What five elements in the table above are found as diatomic molecules?

6. What element in the table is found as a diatomic liquid?

Concerning the Main Group Elements: Complete the following Table

	Group Number	Give or Take Electrons	Ionic Charges	Found as Neutral Elements in Nature Yes/No ??	Form Ionic Bonds or Ionic and Covalent Bonds	Reactivity: High, Low, or None
Alkali Metals						
Alkaline Earth Metals						
Halogens						
Noble Gases						

8. You are given the following neutral elements: Na, Ca, N, Cl. There are 6 possible pairs that can be made from these elements.

- Which pairs can form ionic bonds / compounds?
- Which pairs can form covalent bonds / molecular compounds?
- Which pairs would be solids at room temperature?
- Which pairs would be gases, liquids, or low melting solids at room temperature?
- Which pairs would conduct electricity as solids?
- Which pairs would conduct electricity as liquids?
- Which pairs would conduct electricity dissolved in water?
- Which pairs would form a crystal lattice of repeating + / - units?

9. Two liquids are in cups on a table. Each cup holds the same amount of liquid. After 2 days, there is more of chemical X in the first beaker than chemical Y in the second beaker?

- Which chemical has the higher vapor pressure?
- Which chemical has the higher IMA (intermolecular attraction)
- Which chemical has a lower activation energy?
- If you were told that one of the materials was polar, which would you suspect, X or Y?

10. Draw the Lewis Structures for HI, CH₄, CCl₄, NH₃, H₂S, CO₂ and identify the molecules as being polar or nonpolar.

11. You have the Lewis Structure for a material.

- What is the octet rule?
- Each line in the Lewis Structure represents how many electrons?
- What type of bonding is in each of the molecules above?

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Li	Be									B		N		F	
	Mg								Al	Si		S	Cl	Ar	
K		Ti					Fe				Ge	As	Se	Br	

1. Name one element that:

- is a halogen
- is an alkaline earth metal
- is a noble gas
- is an alkali metal
- has one valence electron
- has three valence electrons
- is a transition metal
- gives electrons away in chemical reactions
- can take electrons in a chemical reaction
- is a semimetal
- has 7 valence electrons

F Cl Br
Be Mg
He Ar
Li K
H Li K
B Al
Ti Fe
H Li K Be Mg Ti Fe Al
H N S Se F Cl Br
B Si Ge As
F Cl Br

2. What type of bonding would you expect between elements

- H and Se
- Fe and Cl
- S and Cl
- Ge and Cl

covalent
ionic
covalent
covalent

3. Which element in the table above has the greatest:

- ionization energy
- electronegativity
- atomic size
- ionic size

He
F
K
Br

4. Which will be larger?

- element Mg or its ion?
- element Cl or its ion?
- element K or element Br?
- K's ion or Br's ion?

Mg⁰
Cl⁻¹
K⁰
Br⁻¹

5. What five elements in the table above are found as diatomic molecules?

H N F Cl Br

6. What element in the table is found as a diatomic liquid?

Br

7. Concerning the Main Group Elements: Complete the following Table

	Group Number	Give or Take Electrons	Ionic Charges	Found as Neutral Elements in Nature Yes/No ??	Form Ionic Bonds or Ionic <u>and</u> Covalent Bonds	Reactivity: High, Low, or None
Alkali Metals	1	Give	+1	No	Ionic	High
Alkaline Earth Metals	2	Give	+2	No	Ionic	High
Halogens	7	Take	-1	Yes	Both	High
Noble Gases	8	No Reaction	NR	Yes	None	NR

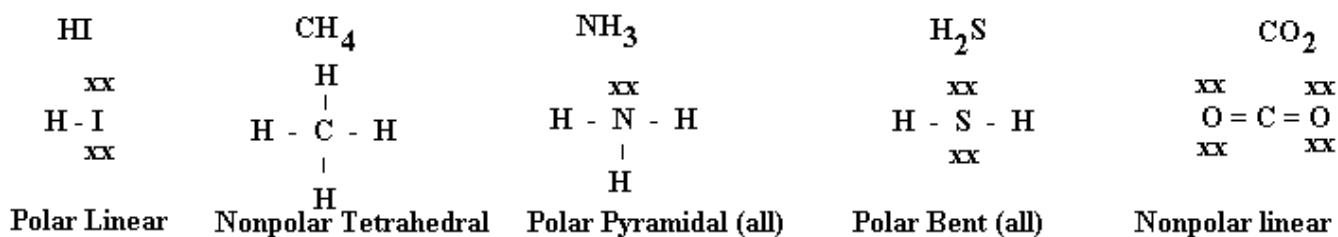
8. You are given the following neutral elements: Na, Ca, N, Cl. There are 6 possible pairs that can be made from these elements.

- Which pairs can form ionic bonds / compounds? **Na₃N, NaCl, Ca₃N₂, CaCl₂**
- Which pairs can form covalent bonds / molecular compounds? **N and Cl (NCl₃)**
- Which pairs would be solids at room temperature? **All the Ionic ones in part a**
- Which pairs would be gases, liquids, or low melting solids at room temperature? **NCl₃**
- Which pairs would conduct electricity as solids? **None**
- Which pairs would conduct electricity as liquids? **All the ionics (part a)**
- Which pairs would conduct electricity dissolved in water? **All the ionics**
- Which pairs would form a crystal lattice of repeating + / - units? **All the ionics**

9. Two liquids are in cups on a table. Each cup holds the same amount of liquid. After 2 days, there is more of chemical X in the first beaker than chemical Y in the second beaker?

- Which chemical has the higher vapor pressure? **Y, more evaporated, vp up**
- Which chemical has the higher IMA (intermolecular attraction)? **X, fewer evaporate**
- Which chemical has a lower activation energy? **Y, more evaporate at same temp**
- If you were told that one of the materials was polar, which would you suspect, X or Y? **X, Polarity causes increased IMA, Ea**

10. Draw the Lewis Structures for HI, CH₄, CCl₄, NH₃, H₂S, CO₂ and identify the molecules as being polar or nonpolar.



11. You have the Lewis Structure for a material.

- What is the octet rule? **all atoms want 8 electrons in valence shells (except Hydrogen)**
- Each line in the Lewis Structure represents how many electrons? **(2)**
- What type of bonding is in each of the molecules above? **covalent**