

Worksheet A

Directions: Complete the following table below.

Element	Group #	Outer Electron Configuration of the Atom (highest energy level including s and p or just s)	Number of Valence Electrons	Lewis Electron Dot Structure	How many electrons are available for bonding?
Example: O	6A	2s <sup>2</sup> 2p <sup>4</sup>	6		Two
1. Ca	2A	4s <sup>2</sup>	2	•Ca•	2
2. N	5A	2s <sup>2</sup> 2p <sup>3</sup>	5	•N•	3
3. Li	1A	3s <sup>1</sup>	1	Li•	1
4. F	7A	2s <sup>2</sup> 2p <sup>5</sup>	7	•F•	1
5. Se	6A	2s <sup>2</sup> 2p <sup>4</sup>	6	•Se•	2
6. C	4A	2s <sup>2</sup> 2p <sup>2</sup>	4	•C•	4

Element	Number of electrons gained or lost to fulfill octet rule	Type of Ion Cation or Anion	Resembles which noble gas?	Diagram of electron dot structure before and after ionization. (Include charge after ionization).
Example K	Gained (circle one) # 1 electron	Cation	Argon	Before: K • After (8 dots):
1. Sr	Gained (circle one) # 2 e <sup>-</sup>	C	Kr	Before: •Sr• After: •Sr• <sup>+2</sup>
2. Cl	Gained (circle one) # 1 e <sup>-</sup>	A	Ar	Before: •Cl• After: •Cl• <sup>-1</sup>
3. S	Gained (circle one) # 2 e <sup>-</sup>	A	Ar	Before: •S• After: •S• <sup>-2</sup>

Match the characteristic with the correct compound. a. Ionic

- Ductile and Malleable c
- Good conductor of heat and electricity a, c
- At room temperature they are a crystalline solid a
- Can conduct an electrical current when melted or dissolved in water. a
- At room temperature they can be a solid, liquid or gas. b
- These two compounds both are good conductors of electricity. a & c
- Held together by electrostatic forces. a
- Held together by intermolecular forces. b
- Held together by free-floating valence electrons. c
- High melting points a

Draw the Lewis dot structure for P.



How many lone pairs? 1 How many electrons are available for bonding? 3

b. Molecular

c. Metallic

Lewis Dot Worksheet A1

Answer the questions for each element. Then draw the correct Lewis dot structure for each.

<p><b>F</b></p> <p># of valence electrons <u>7</u></p> <p># of bonds formed <u>1</u></p> <p># of lone pairs <u>3</u></p> <p><u>:F:</u></p>	<p><b>S</b></p> <p># of valence electrons <u>6</u></p> <p># of bonds formed <u>2</u></p> <p># of lone pairs <u>2</u></p> <p><u>:S:</u></p>	<p><b>K</b></p> <p># of valence electrons <u>1</u></p> <p># of bonds formed <u>0</u></p> <p># of lone pairs <u>0</u></p> <p><u>K.</u></p>
<p><b>Al</b></p> <p># of valence electrons <u>3</u></p> <p># of bonds formed <u>3</u></p> <p># of lone pairs <u>0</u></p> <p><u>·Al·</u></p>	<p><b>O</b></p> <p># of valence electrons <u>6</u></p> <p># of bonds formed <u>2</u></p> <p># of lone pairs <u>2</u></p> <p><u>:O:</u></p>	<p><b>Cl</b></p> <p># of valence electrons <u>7</u></p> <p># of bonds formed <u>1</u></p> <p># of lone pairs <u>3</u></p> <p><u>:Cl:</u></p>
<p><b>Ne</b></p> <p># of valence electrons <u>8</u></p> <p># of bonds formed <u>0</u></p> <p># of lone pairs <u>4</u></p> <p><u>:Ne:</u></p>	<p><b>Ca</b></p> <p># of valence electrons <u>2</u></p> <p># of bonds formed <u>2</u></p> <p># of lone pairs <u>0</u></p> <p><u>·Ca·</u></p>	<p><b>P</b></p> <p># of valence electrons <u>5</u></p> <p># of bonds formed <u>3</u></p> <p># of lone pairs <u>1</u></p> <p><u>:P:</u></p>

An ionic compound is composed of a metal & a nonmetal.

A molecular compound is also known as covalent & is composed of only nonmetals.

Classify the following elements as ionic or molecular.

Li<sub>2</sub>O Ionic (I)      CO<sub>2</sub> M

SO<sub>2</sub> molecular (M)      KCl I

2 nonmetals

N<sub>2</sub>O<sub>4</sub> M

AgF I

metal nonmetal

Write the following ionic compounds:

1. Na<sub>2</sub>S Sodium sulfide
2. CaO Calcium oxide
3. CaCl<sub>2</sub> Calcium chloride
4. SrI<sub>2</sub> Srtrontium iodide
5. LiF Lithium fluoride
6. AlCl<sub>3</sub> aluminum chloride
7. Ga<sub>2</sub>O<sub>3</sub> Gallium oxide
8. Na<sub>2</sub>O Sodium oxide
9. GaBr<sub>3</sub> Gallium bromide
10. K<sub>3</sub>P Potassium phosphide
11. Na<sub>2</sub>S Sodium sulfide
12. MgO magnesium oxide
13. Ca<sub>3</sub>P<sub>2</sub> calcium phosphide
14. CaCl<sub>2</sub> calcium chloride
15. SrI<sub>2</sub> strontium iodide
16. KF potassium fluoride
17. AlCl<sub>3</sub> aluminum chloride
18. Al<sub>2</sub>O<sub>3</sub> aluminum oxide
19. GaCl<sub>3</sub> Gallium chloride

Concept Check:

- a. What type of bond do all ionic compounds form? ionic bonds and they are held together by electrostatic forces.
- b. What ion is always written first? Cation changes to -ide
- c. What happens to the ending of the anion? Yes or no (circle one)
- d. All ionic compounds are electrically neutral (circle one) ionic Molecular Metallic (circle all that apply)
- e. Which type of compound conducts electricity?

Classify the following compounds as ionic or molecular:

- a. LiBr I
- b. SO<sub>4</sub> M
- c. NiO I
- d. AlP I
- e. MgS I
- f. PO<sub>4</sub> M
- g. CO<sub>2</sub> M
- h. IC<sub>3</sub> M
- i. IO<sub>7</sub> M
- j. XeF<sub>4</sub> M

(I)

(M)