



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

Period: \_\_\_\_\_

Assigned on Tuesday, September 09, 2025

**4.2 Basics of Bonding****Due Wednesday, September 10, 2025**

1. Fill in the following chart.

Nuclear Symbol	Isotope name	Atomic Number	Mass Number (amu)	Number of Protons	Number of Neutrons	Number of Electrons	Ion Charge	Cation or Anion ?	Group #	Period #
$^{42}_{20}\text{Ca}^{2+}$										
	aluminum -26					10				
			127	53		54				
		33			40		3-			
					70		4+		14	5

2. Identify the type of bonds that will exist in each of the following compounds.

- a)  $\text{Na}_3\text{P}$  \_\_\_\_\_ c)  $\text{PCl}_5$  \_\_\_\_\_ e)  $\text{CO}_2$  \_\_\_\_\_ g)  $\text{Al}_2(\text{SO}_4)_3$  \_\_\_\_\_  
b)  $\text{NH}_3$  \_\_\_\_\_ d)  $\text{BrF}$  \_\_\_\_\_ f)  $\text{LiOH}$  \_\_\_\_\_ h)  $\text{Fe}_2\text{S}_3$  \_\_\_\_\_

3. What one word would you use to describe: a) ionic bonding: \_\_\_\_\_ b) covalent bonding: \_\_\_\_\_

4. Four ions are shown in the table below. Which pair will form the strongest ionic bond? Explain your answer in terms of Coulomb's Law. (Ionic radius means the distance from the nucleus to the outermost electron.)

Ion	Ionic Radius (pm)
$\text{K}^+$	280
$\text{Be}^{2+}$	153
$\text{F}^-$	119
$\text{I}^-$	214

5. Think about our discussion of metallic bonding and why metals conduct electricity. In your bond lab, you found out that ionic compounds do not conduct electricity as solids, but they do conduct electricity when they are dissolved in water. Offer an explanation for why this is the case.

6. Why do we say that the representative particle of a molecular compound (a compound containing covalent bonds) is a molecule but the representative particle of an ionic compound (a compound containing ionic bonds) is a formula unit? Use a particle diagram in your explanation.

7. List three properties that are unique to ionic compounds and three that are unique to molecular compounds.