

Chemistry – Chapters 6-8 Book problems #2: Chapter review

Refer to the table you have for electronegativities, then use the following table to determine the values asked for in the following questions:

Electronegativity difference range	Most probable type of bond
0.0 – 0.4	Nonpolar covalent
0.4 – 1.0	Moderately polar covalent
1.0 – 2.0	Very polar covalent
>2.0	Ionic

1. Identify the bonds between atoms of each pair of elements as nonpolar covalent, moderately polar covalent, very polar covalent, or ionic:

- A. H and Br
- B. K and Cl
- C. C and O
- D. Cl and F
- E. Li and O
- F. Br and Br

2. Place the following covalent bonds in order from least to most polar:

- A. H – Cl
- B. H – Br
- C. H – S
- D. H – C

3. How do electronegativity values determine the charge distribution in a polar covalent bond? In other words, what do the numbers mean in terms of what type of ions an element forms?

4. Which element in each pair has atoms with a larger atomic radius?

- A. Sodium, lithium
- B. Strontium, magnesium
- C. Carbon, germanium
- D. Selenium, oxygen

5. Which element in each pair has a greater first ionization energy?

- A. Lithium, boron
- B. Magnesium, strontium
- C. Cesium, aluminum

6. Arrange the following groups of elements in order of increasing ionization energy:

- A. Be, Mg, Sr
- B. Bi, Cs, Ba
- C. Na, Al, S

7. How does the ionic radius of a typical **metal** compare with its atomic radius? (Think about what type of ion metals tend to form)

8. Which particle has the larger radius in each atom/ion pair?

A. Na, Na⁺

C. I, I⁻

B. S, S²⁻

D. Al, Al³⁺

9. Which element in each pair has a higher electronegativity value? (think about where they are on the periodic table to answer, not by referring to the values table itself)

A. Cl, F

C. Mg, Ne

B. C, N

D. As, Ca

10. For which of these properties does lithium have a **larger** value than potassium?

A. first ionization energy

B. atomic radius

C. electronegativity

D. ionic radius

11. Explain why fluorine has a smaller atomic radius than both oxygen and chlorine.

12. In each pair, which ion is larger?

A. Ca²⁺, Mg²⁺

C. Cu⁺, Cu²⁺

B. Cl⁻, P³⁻