

Chapter 12 – Chemical Bonding

1. A **covalent bond** is a chemical bond characterized by the sharing of one or more pairs of valence electrons.
2. Predict which of the following has an ionic bond (refer to the Periodic Table for help).
 - a. **CaO**
 - b. CO_2
 - c. **FeO**
 - d. N_2O_5
 - e. SO_3
 - f. **MgO**
 - g. **ZnO**
 - h. BrCl
 - i. **KBr**
 - j. **SrI_2**
 - k. HBr
 - l. IBr
 - m. **KF**
 - n. **CuI**
3. The noble gas **neon** is isoelectronic with an aluminum ion.
4. Predict which of the following are isoelectronic with the noble gas argon.

N^{3-} **Cl⁻** Mg^{2+} **K⁺** **Ca²⁺** H^+ **S²⁻** O^{2-} Br^- **P³⁻**

5. Draw the Lewis Dot structure for the following:
 - a. N
 - b. F
 - c. S
 - d. Ca
6. Complete the following sentences to make them true.
 - a. Bonding electrons are **distributed** over the entire NO molecule.
 - b. The bond length is **less** than the sum of the two atomic radii.
 - c. Breaking an N-O bond **requires** energy.
7. What is the total number of valence electrons in one molecule of N_2O_3 ? **28**
8. For the following molecules
 - i. Determine the total number of valence electrons.
 - j. Draw the Lewis Dot Structure (the central atom is underlined).
 - k. Determine the molecular shape.
 - l. Determine the bond angle.
 - m. Determine the polarity of the molecule.

1) **N₂**

see me for structure!!

shape: **linear** angle: **180°**
polarity: **nonpolar**

3) **SeO₂**

see me for structure!!

shape: **bent** angle: **<120°**
polarity: **polar**

5) **NO₂⁻**

see me for structure!!

shape: **bent** angle: **<120°**
polarity: **polar**

2) **H2S**

see me for structure!!

shape: **bent** angle: **<109.5°**
polarity: **polar**

4) **PI₃**

see me for structure!!

shape: **pyramidal** angle: **<109.5°**
polarity: **polar**

6) **PO₄³⁻**

see me for structure!!

shape: **tetrahedral** angle: **109.5°**
polarity: **nonpolar**