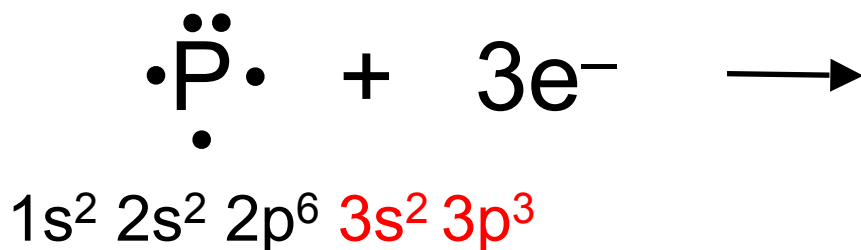
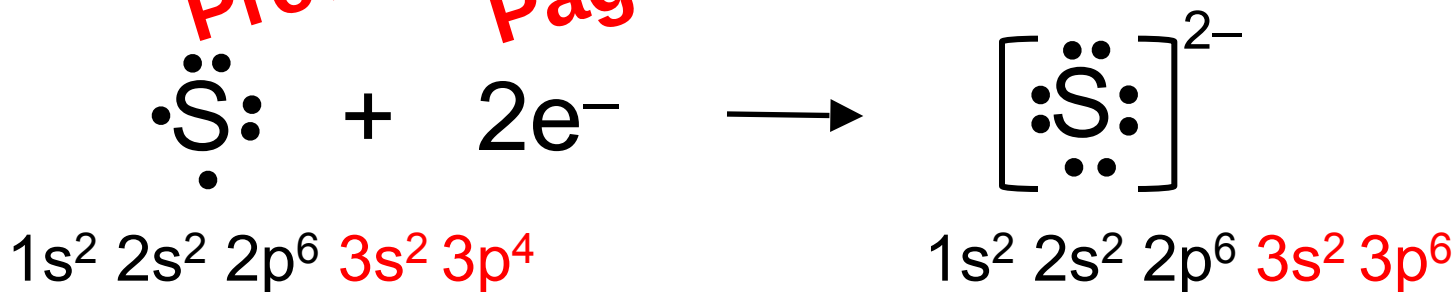


Formation of Anions

Some examples...

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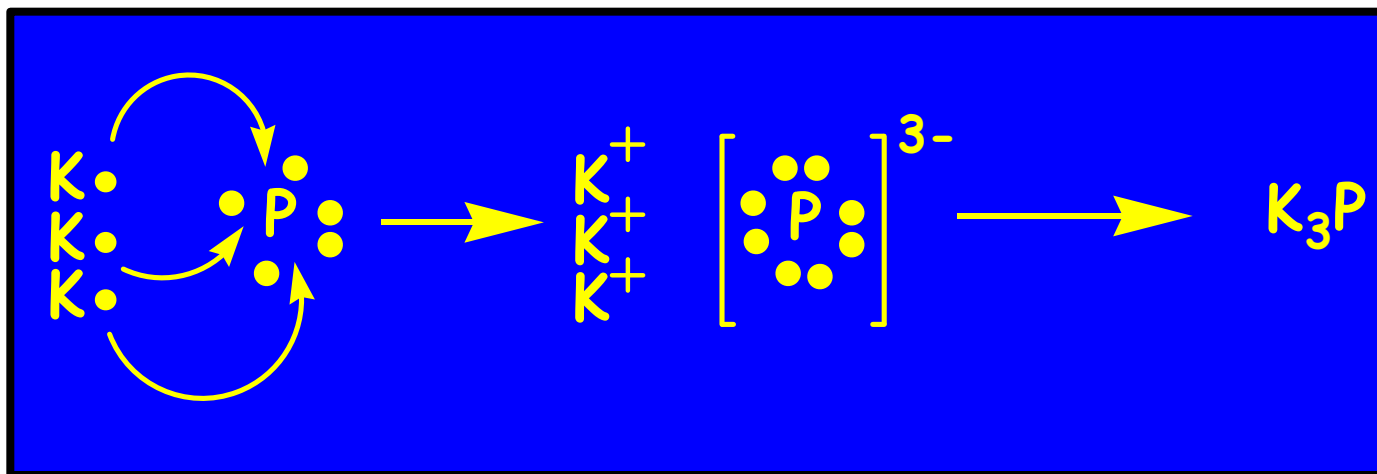
Lewis Structures for Ionic Compounds

- Using Lewis Dot Diagrams (Lewis Structures) to show ionic compound formation

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Example #1: What do we expect when Potassium (K) and Phosphorus (P) react?

- To get an octet, K must lose one electron and P must gain three. How can Lewis diagrams help?



Lewis Structures for Molecular Compounds

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- In the beginning of the chapter, we drew electron dot formulas for atoms.
- The number of dots around each atom is equal to the number of valence electrons the atom has.
- We will now draw electron dot formulas for molecules (also called *Lewis structures*).
- A Lewis structure shows the bonds between atoms and helps us to visualize the arrangement of atoms in a molecule.

Guidelines for Drawing Lewis Structures of Molecules

1. Add up the valence electrons of all atoms in the molecule.
2. Divide the total valence electrons by 2 to find the number of electron pairs in the molecule (makes counting easier).
3. Surround the *central atom* with 4 electron pairs.
4. Arrange the other atoms around the central atom.
(Make molecule as symmetrical as possible)

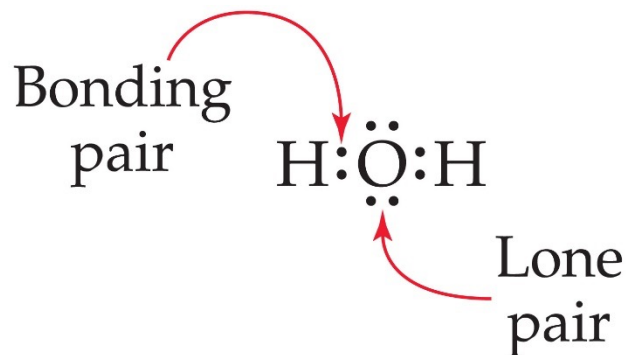
Bonding vs Nonbonding Electrons

Bonding electrons:

- Electron pairs that are shared by atoms.

Nonbonding electrons (lone pairs):

- Electrons that are only on one atom.



or



Dashed lines can be used to represent pairs of bonding electrons

More Complicated Lewis Structures

Note: When there are too many atoms to fit around the central atom, hydrogen usually goes on the outside.



Electron Dot Formula for CO_3^{2-}

What is the Electron dot formula for CO_3^{2-} ?

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Electronegativity Differences

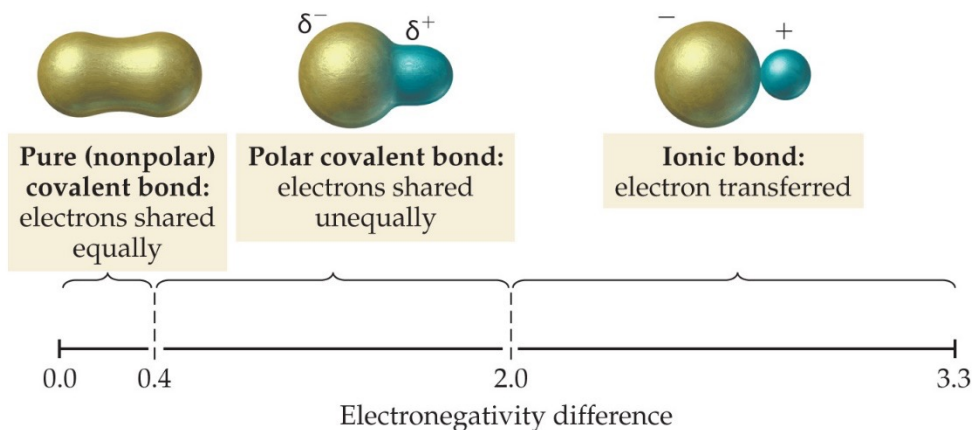
- Using the electronegativity values on your periodic table, we see the electronegativity of H is 2.1 and Cl is 3.0.
- Since there is a difference in electronegativity between the two elements ($3.0 - 2.1 = 0.9$), the bond in H–Cl is polar.
- Since Cl is more electronegative, the bonding electrons are attracted toward the Cl atom and away from the H atom. This will give the Cl atom a *slightly* negative charge and the H atom a *slightly* positive charge.

Electronegativity and Bond Type

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Electronegativity Difference	Type of Bond	Example
< 0.4	Nonpolar Covalent	H–C
$0.4 - 2.0$	Polar Covalent	H–F
> 2.0	Ionic	NaCl

* These are just guidelines. Textbooks vary with these ranges



- The degree of bond polarity is a continuous function.
- Scientists arbitrarily decided on these ranges