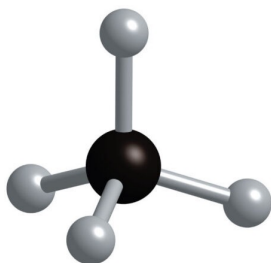


Central Atoms and Covalent Bonding

Central Atoms

Central Atoms are the atoms that sit in the middle (*center*) of the atomic structure, and have other atoms covalently bonded to its structure



Carbon (*black sphere*) is the central atom, surrounded by 4 Hydrogen Atoms in *Methane* (CH_4)

The number of bonds for each central atom is based on the group of each atom

Central Atom Group Number	Number of Single Covalent Bonds (Steric Number)
Group 4A (14)	4
Group 5A (15)	3
Group 6A (16)	2
Group 7A (17)	1

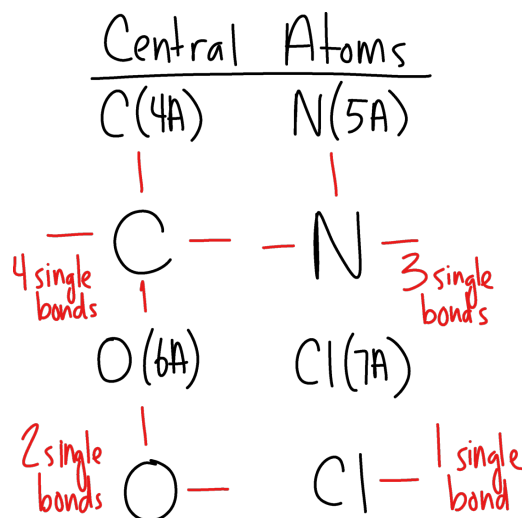
8

Central Atoms and Covalent Bonding

Central Atom Electron Pairs

Central Atoms that produce 1, 2, or 3 single bonds also contain pairs of electrons around atom

Central Atom Group #	Number of Electron Pairs	Number of Single Bonds
Group 4A	0	4
Group 5A	1	3
Group 6A	2	2
Group 7A	3	1



9

Drawing Structures

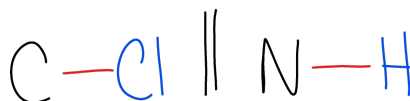
Process of Drawing Structures

1. Write the central atom in the center of the structure (*given*)
2. Write atoms and add a single bond between the central atom and each outer atom (*bonds given*)
3. Fill in the outer valence electrons.
 1. Write a pair of electrons from each location not bonded
 2. Count the total number of electrons in the structure

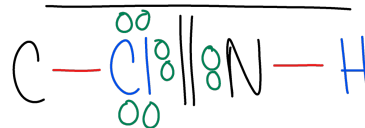
Central Atom w/ bonds



Fill in outer atoms

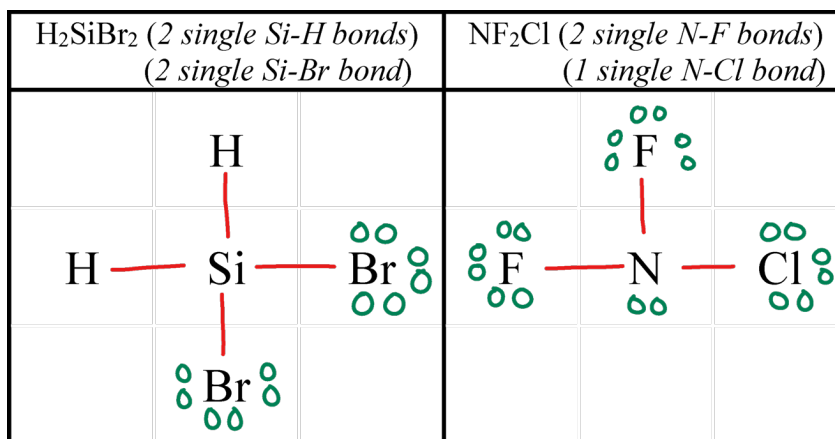


Add outer val e⁻



10

Covalent Molecule Examples



H: 1 val e⁻ Br: 7 val e⁻
Si: 4 single

F: 7 val e⁻ Cl: 7 val e⁻
N: 3 single + 1 pair

11