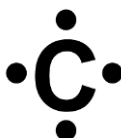
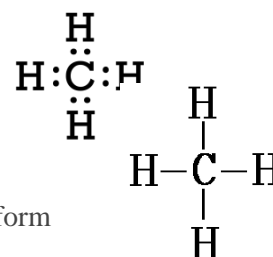


Writing Lewis Structures

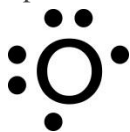
- An electron dot diagram, also known as a Lewis Structure, is a representation of valence electrons in a single atom, and can be further utilized to depict the bonds that form based on the available electrons for covalent bonding between multiple atoms.
- Each atom has a characteristic dot diagram based on its position in the periodic table and this reflects its potential for fulfillment of the octet rule. As a general rule, the noble gases have a filled octet (column VIII with eight valence electrons) and each preceding column has successively one fewer.
- For example, Carbon is in column IV and has four valence electrons. It can therefore be represented as:



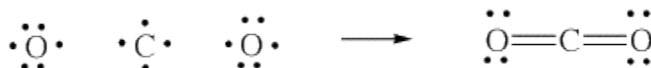
- Each of these "lone" electrons can form a bond by sharing the orbital with another unbonded electron. Hydrogen, being in column I, has a single valence electron, and will therefore satisfy carbon's octet thusly:



- When a compound has bonded electrons (as with CH₄) it is most accurate to diagram it with lines representing each of the single bonds.
- Using carbon again for a slightly more complicated example, it can also form double bonds. This is the case when carbon bonds to two oxygen atoms, resulting in CO₂. The oxygen atoms (with six valence electrons in column VI) are each represented as:



- Because carbon is the least electronegative of the atoms involved, it is placed centrally and its valence electrons will migrate toward the more electronegative oxygens to form two double bonds and a linear structure. This can be written as:



(oxygen's remaining lone pairs are still shown)

Practice Problems:

Draw each of the following with all valence electrons (bonded or unbonded) represented

Single Atom

- 1) Mg
- 2) Br
- 3) N

Compounds:

- 1) BCl₃
- 2) N₂H₂
- 3) HClO