

HW10, December 5th, 2023

Rules for creating Lewis diagrams:

1. Sum the valence electrons (electrons from the outer shell) for all atoms. It is crucial to keep track of the total number of valence electrons.
2. A pair of electrons forms a bond between atoms.
3. Arrange the remaining electrons to satisfy the octet rule for second-row elements in the periodic table or the duet rule (two electrons) for hydrogen.
4. The octet rule has exceptions. For example, in certain cases, such as the Lewis structure of BF_3 , there can be a deficiency of electrons. Additionally, structures starting from period 3 elements may have an extended octet, as seen in the Lewis structure of SF_6 .
5. It is helpful to look at electron diagrams of elements (available on the website ptable.com) to gain a better understanding of Lewis structures.

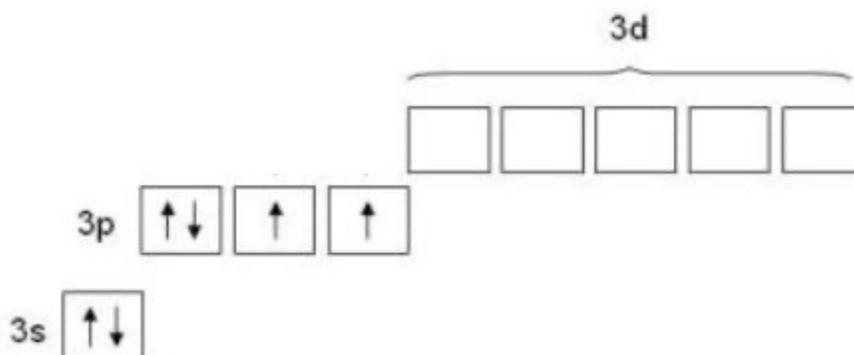
H_2O : $1+1+6 = 18$ valence electrons in water. Lewis structure $\text{H}:\ddot{\text{O}}:\text{H}$

Structural formula with bonds H-O-H

Lewis structure with bonds (shared pair of electrons) and lone pairs of electrons



Electron diagram for the outer shell of sulfur elements (S) looks like this:

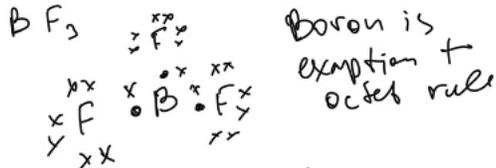


The Lewis structure from HW9

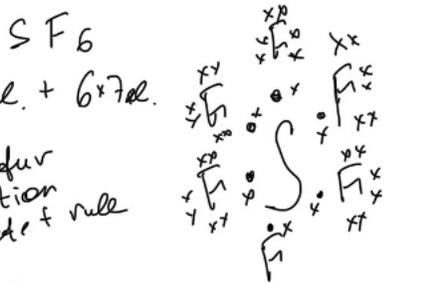
nitrogen trifluoride



boron trifluoride

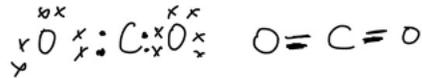


Sulfur hexafluoride

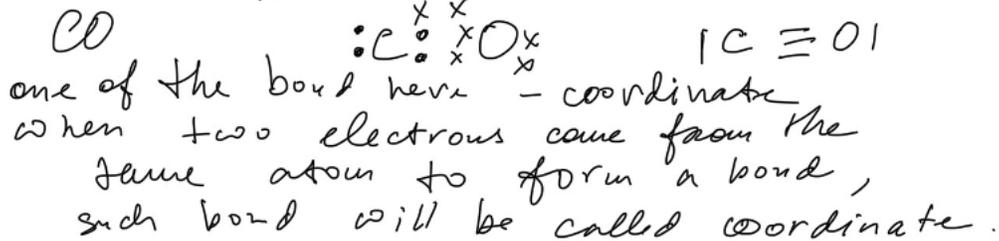


carbon dioxide

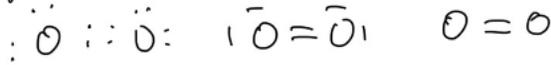
CO_2 4+12 16el.



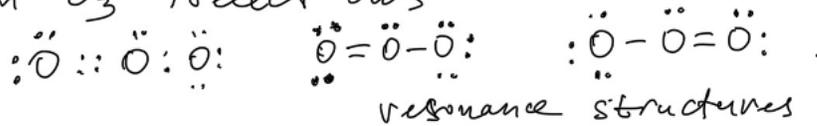
* Carbon monoxide



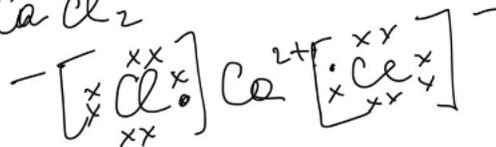
oxygen O_2



* ozone O_3 18 electrons



$CaCl_2$



Questions:

1. Write hydrogen peroxide Lewis structure, H_2O_2
2. Write electron diagram for phosphorus (P) and Lewis structure for PCl_5
3. Write electron diagram for chlorine (Cl) and Lewis structure for ClF_3