

Exceptions to the Octet Rule

C, N, O, F always follow the octet rule.

Be and B usually have fewer than 8 electrons.

Third period and lower elements can exceed the octet rule.

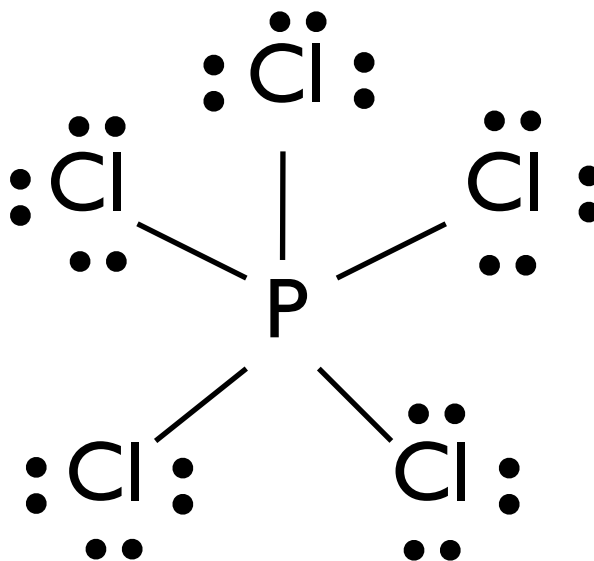
Try to satisfy the octet rule then, place any extra electrons on an element in the third period or lower.

Ex: PCl_5

P- 5e-

Cl- 7e- x5= 35e-

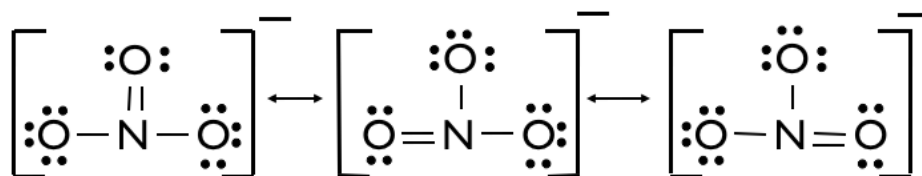
Total- 40e-



Use 10 e- to form bonds, leaving 30 e-

Resonance Structures

Draw the Lewis structure for NO_3^-



Resonance occurs when more than one equivalent Lewis structure can be drawn.

Resonance is needed because the localized electron model can not accurately display the true arrangement of the electrons.

The true structure is a combination of all the resonance forms. It is not one of the structures but all of them superimposed.

Formal Charge

When there are more than one Lewis structure that are not equivalent we use minimal formal charge to decide which is the most correct structure. Formal charge is determined for each atom in a molecule by:

Taking the normal number of valence electrons the atom has then subtract the sum of lone pair electrons and half the bonding electrons. The result is the formal charge on the atom.

Ex: SO_4^{2-}

