**Resonance and curved arrow formalism**



**NO3-1**



**In order the resonance to occur it should be:**

1. **Charged center carrying, negative or positive charge or radical.**
2. **This charged center should be conjucated to double or triple bond(s)**
3. **Double or triple bond conjucated with another**





**Formal Charges**

* **Sometimes it is necessary to have structures with *formal charges* on individual atoms**
* **We compare the bonding of the atom in the molecule to the valence electron structure**
* **If the atom has one more electron in the molecule, it is shown with a “-” charge**
* **If the atom has one less electron, it is shown with a “+” charge**
* **Neutral molecules with both a “+” and a “-” are dipolar**
* **In order to calculate formal charge, you should be able to draw the Lewis structure first.**

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**Example: calculate the formal charge for each atom in CO3-2**

1. Draw its lewis structure.



1. Then calculate the formal charge for each atom

Formal charge of O1 = 6 – 0.5(2) – 6 = -1

Formal charge of O2 = 6 – 0.5(2) – 6 = -1

Formal charge of O3 = 6 – 0.5(4) – 4 = 0.0

Formal charge of C = 4 – 0.5(8) – 0.0= 0.0

**Questions: calculate the formal charge for the following**

**NO3-1**

**NH4+1**