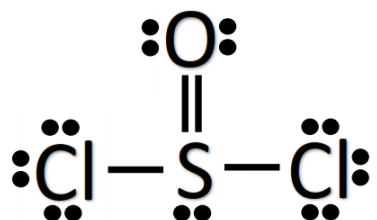


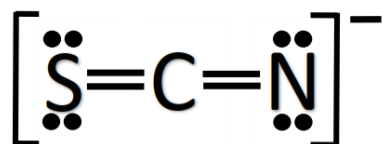
## Formal charge

1) Identify the formal charge on each atom in the following molecules:

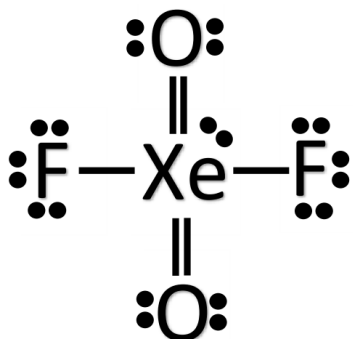
a)  $\text{SOCl}_2$  (thionyl chloride)



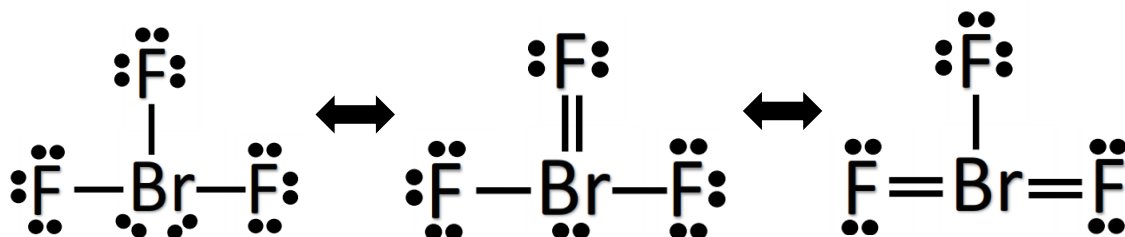
b)  $\text{SCN}^-$  (thiocyanate ion)



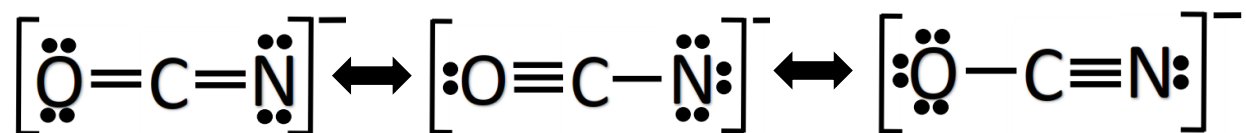
c)  $\text{XeO}_2\text{F}_2$  (xenon dioxodifluoride)



2) Assign formal charges and determine the preferred Lewis structure of  $\text{BrF}_3$



3) Assign formal charges and determine the preferred Lewis structure of the cyanate ion:

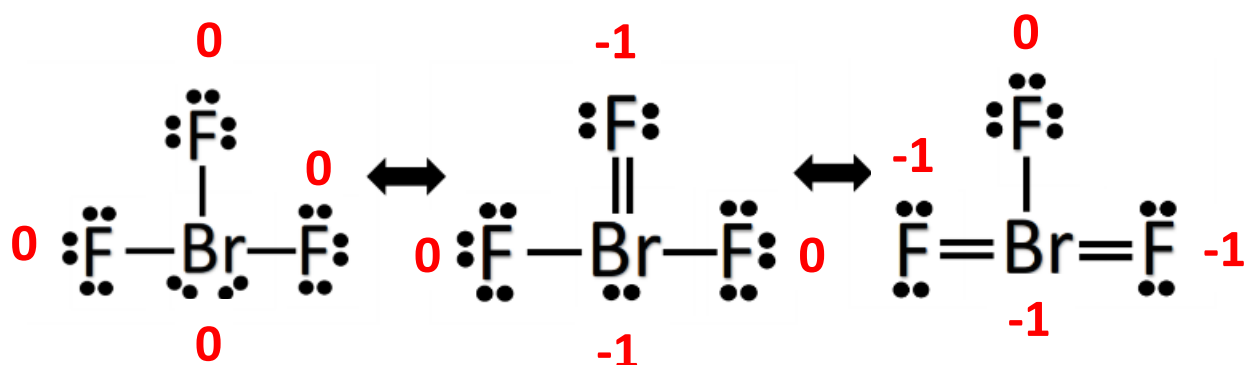


**Answers:**

1)

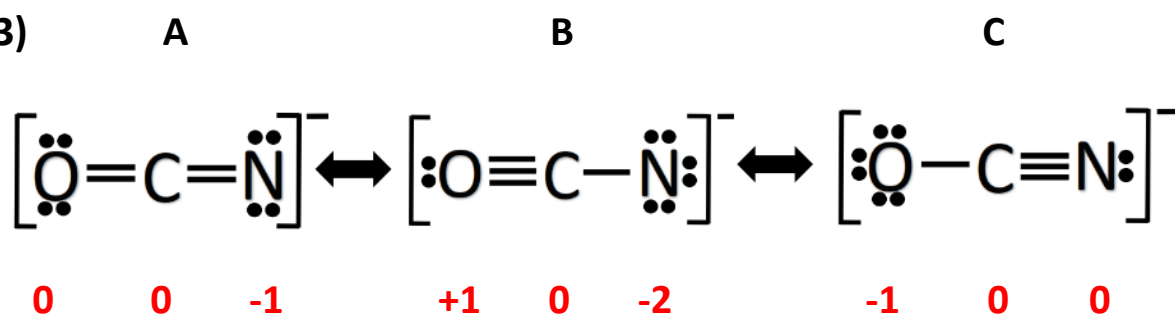
a) **S: 0 Cl: 0 O: 0**b) **S: 0 Cl: 0 N: -1**c) **Xe: +2 F: 0 O: 0**

2)



The Lewis structure on the left is the preferred Lewis structure – the formal charges on each atom is zero.

3)



Lewis structure C is the preferred Lewis structure. Even though Lewis structures A and C have the same overall formal charge (the same as the charge on the ion), structure C has the negative formal charge assigned to the most electronegative atom (O).