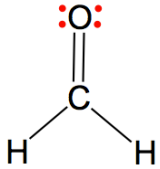
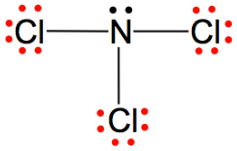
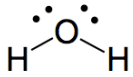
CONCEPT: ELECTRON COUNTING

- In main-group chemistry, we use the _____ rule as an indicator of reactivity.
  - □ If an element possessed less than 8 electrons around it then it would accept an electron pair.







- Electron count is also important in our understanding of the mechanistic basis of transition metal-catalyzed reactions.
  - □ To determine the electron count for a transition-metal complex we employ the following equation:

Formula

$$\textbf{Electron Count} = \text{Valence of Metal M} - Q_M + (\text{X-Type Ligands}) + 2\,(\text{L-Type Ligands})$$

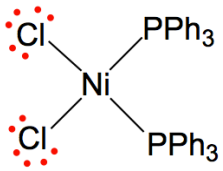
- □ Valence of Metal M: _____ + _____ electrons.

Ni (Z = 28) $[Ar]\,4s^2 3d^8$

- □ Q_M = the _____ of the transition metal complex.

$[Zn(H_2O)_4]^{2+}$ Q_M = _____ $Pd(NH_3)_2Cl_2$ Q_M = _____

- □ X-Type Ligands donate _____ electron(s) to the metal cation of the complex molecule or ion.
- □ L-Type Ligands donate _____ electron(s) and doesn't change the formal charge of the metal cation.



EXAMPLE: What is the electron count of the complex ion $[Co(CN)_6]^{3-}$?

PRACTICE: What is the electron count of the complex ion $[Cr(NH_3)_4Cl_2]^{+}$?