

Using Coordinate Covalent Bonds

(Honors Chemistry)

<u>Dot Structures</u>	<u>Structural Formula</u>	<u>Unshared Pair</u>
1. CO	$:C \equiv O:$	2
2. SO ₂	$:\ddot{O} = \ddot{S} \rightarrow \ddot{O}:$	6
3. NH ₃ BH ₃	$ \begin{array}{c} \text{H} \\ \\ \text{H} - \text{N} \\ \\ \text{H} \end{array} \rightarrow \begin{array}{c} \text{H} \\ \\ \text{B} - \text{H} \\ \\ \text{H} \end{array} $	∅
4. NH ₄ ⁺	$ \begin{array}{c} \text{H}^+ \\ \uparrow \\ \text{H} - \text{N} - \text{H} \\ \\ \text{H} \end{array} $	∅
5. NO ₃ H	$ \begin{array}{c} :\ddot{O}: \\ \uparrow \\ \text{H} - \ddot{O} - \text{N} = \ddot{O}: \end{array} $	7
6. H ₃ O ⁺	$ \begin{array}{c} \ddot{O} \\ \\ \text{H} - \ddot{O} \rightarrow \text{H}^+ \\ \\ \text{H} \end{array} $	1

Formation of Polyatomic ions

(Honors Chemistry)

Show the structural formula for the following polyatomic ions. Some of them use coordinate covalent bonds.

<u>Dot Formula</u>	<u>Structural Formula</u>
1. SO_4^{2-} (Add 2 electrons)	<p>Structural formula of SO_4^{2-} showing coordinate covalent bonds from Na^+ ions to the single-bonded oxygen atoms. The central sulfur atom is bonded to four oxygen atoms: two single bonds and two double bonds. The overall charge is 2^-.</p>
2. CO_3^{2-} (Add 2 electrons)	<p>Structural formula of CO_3^{2-} showing coordinate covalent bonds from Mg^{2+} ions to the single-bonded oxygen atoms. The central carbon atom is bonded to three oxygen atoms: one single bond and two double bonds. The overall charge is 2^-.</p>
3. NO_3^- (Add 1 electron)	<p>Structural formula of NO_3^- showing a coordinate covalent bond from K^+ to the single-bonded oxygen atom. The central nitrogen atom is bonded to three oxygen atoms: one single bond and two double bonds. The overall charge is 1^-.</p>
5. PO_3^{3-} (Add 3 electrons)	<p>Structural formula of PO_3^{3-} showing coordinate covalent bonds from Al^{3+} ions to all three oxygen atoms. The central phosphorus atom is bonded to three oxygen atoms: one single bond and two double bonds. The overall charge is 3^-.</p>
7. OH^- (Add 1 electron)	<p>Structural formula of OH^- showing a coordinate covalent bond from Na^+ to the oxygen atom. The oxygen atom is bonded to one hydrogen atom. The overall charge is 1^-.</p>
8. CN^- (Add 1 electron)	<p>Structural formula of CN^- showing a coordinate covalent bond from Na^+ to the carbon atom. The carbon atom is triple-bonded to the nitrogen atom. The overall charge is 1^-.</p>