

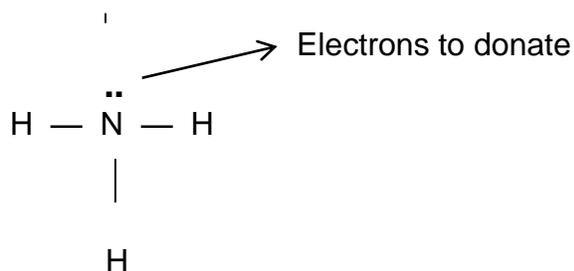
Identify Lewis Acids/Bases and Coordinate Covalent Bonded Compounds in a Chemical Equation

Lewis Acid is any ionic or molecular species that can accept a pair of electrons in the formation of a coordinate covalent bond.

Lewis Base is any ionic or molecular species that can donate a pair of electrons in the formation of a coordinate covalent bond.

Neutralization is the formation of a coordinate covalent bond between the donor and the acceptor compound.

1. Solving problems focuses on identifying the Lewis base. Once the Lewis base is identified, the other reactant (on the left side of the equation) must be the Lewis acid. The compound on the right has the coordinate covalent bond.
2. Lewis bases can be identified by the following process.
 - a. First, check the compound to determine if it is a negative ion. If so, it will have excess electrons to donate, and, by definition be a Lewis base.
 - b. If there are no obvious charges, is there is an ionic compound present? It will have a negative ion. For example, Na_2O , can donate 2 electrons (O^{2-}).
 - c. If neither (a) nor (b) is satisfied, then draw a Lewis structure to find the molecule whose chemical atom has electrons to donate (e.g. NH_3).



3. Once the Lewis base has been identified, the rest of the problem can be solved.

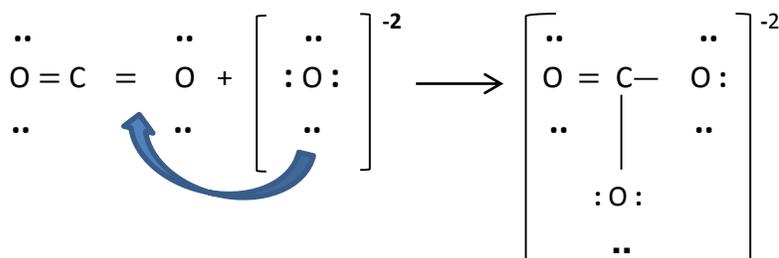
Examples:

1. $\text{NH}_2^- + \text{H}^+ \rightarrow \text{NH}_3$
2. $\text{BF}_3 + \text{F}^- \rightarrow \text{BF}_4^-$
3. $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$
4. $\text{SO}_2 + \text{CaO} \rightarrow \text{CaSO}_3$

				Coordinate Covalent Bonded Compounds
1.	NH_2^-	Lewis Base	H^+ Lewis Acid	NH_3
2.	BF_3	Lewis Acid	F^- Lewis Base	BF_4^-
3.	CO_2	Lewis Acid	H_2O Lewis Base	H_2CO_3
4.	SO_2	Lewis Acid	$CaO(O^-)^2$ Lewis Base.	$CaSO_3$

Additional examples requiring Lewis structures

1. Draw the reaction between CO_2 and O^{2-} to form CO_3^{2-}



2. Explain the reaction between NH_3 and BF_3 . Which is the Lewis acid and which is the Lewis base?

Steps 2a and 2b on preceding page cannot be used to identify the Lewis acid or Lewis base. Therefore, you must draw Lewis structures to identify the Lewis acid and base.

