

Some general rules to work out Lewis structures.

Outer atoms have 8 electrons in its outer shell (except hydrogen, it should have two). This is done by using single, double, or triple bonds, it also could be + or - charges. Dots and crosses can be used in Lewis structures to indicate the electrons.

If the central atom is from period 2 it should have no more than 8 electrons in its outer shell. It should have a noble gas configuration (not always).

If the central atom is from period 3 it may have up to 18 electrons in its outer shell.

The following approach can be used to work out the Lewis structures of molecules/ions just containing atoms from period 2 in the periodic table:

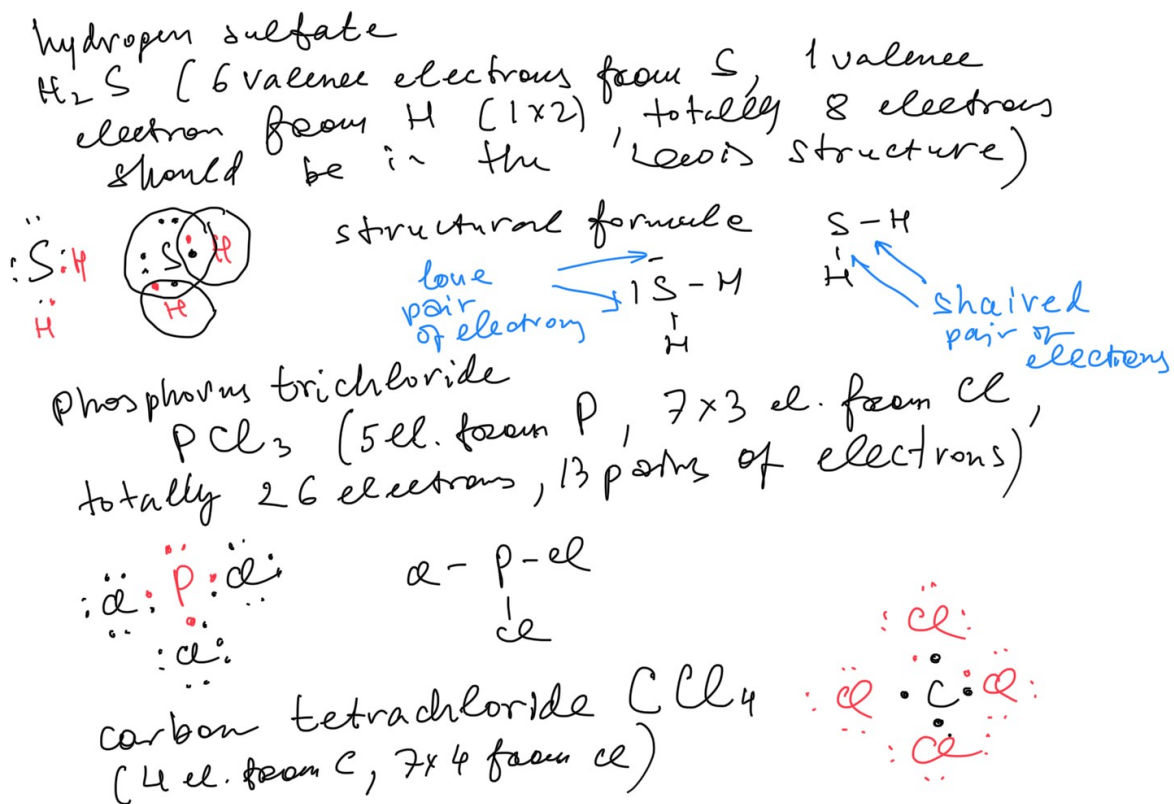
Add up the valence electrons from all atoms.

Divide by two to get the total number of electron pairs.

Each pair of electrons is represented by a line (or two dots).

Arrange the electron pairs so that all the atoms are joined together by at least single bonds and the outer atoms have full outer shells.

If necessary, rearrange the electron pairs so that every atom has four pairs of electrons (octet rule).



ammonia

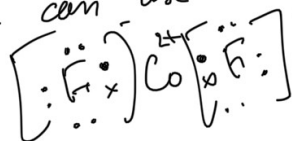


nitrogen gas,  $\text{N}_2$  (10 valence electrons)  $:\text{N}::\text{N}:$

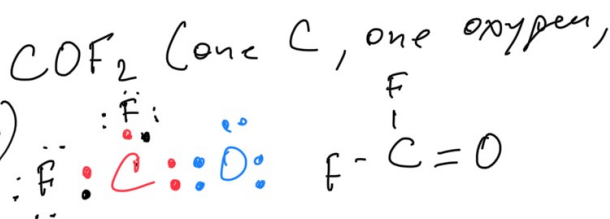


Correcting mistake

cobalt fluoride  $\text{CoF}_2$ , mostly ionic compound  
we can use charges to write down dot structure.



covalent compound  
two fluorine atoms)



**Write down the Lewis structures for the following compounds:**

Nitrogen trifluoride,  $\text{NF}_3$

Boron trifluoride,  $\text{BF}_3$

Sulfur hexafluoride,  $\text{SF}_6$

Carbon dioxide,  $\text{CO}_2$

Carbon monoxide,  $\text{CO}$

Ozon,  $\text{O}_3$

Oxygen,  $\text{O}_2$

Calcium chloride (ionic compound),  $\text{CaCl}_2$