

Examples of Lewis Dot Structures

Three Basic Rules:

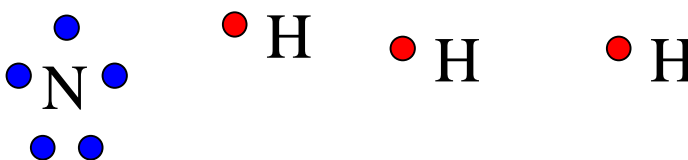
1. Each *valence* electron is represented by 1 dot.
2. For hydrogen, halogens and second period non-metals, the number of electrons needed to complete a shell is the number of electrons that the atom will have to share when forming a covalent bond.
3. Each atom in the stable compound must be satisfied. Otherwise you'll have an unstable radical.

Element	Valence electrons (number of dots)	Missing Electrons	Number of electrons to be shared
H	1	$2 - 1 = 1$	1
C	4	$8 - 4 = 4$	4
N	5	$8 - 5 = 3$	3
O	6	$8 - 6 = 2$	2
F	7	$8 - 7 = 1$	1
Cl	7	$8 - 7 = 1$	1
Br	7	$8 - 7 = 1$	1
I	7	$8 - 7 = 1$	1

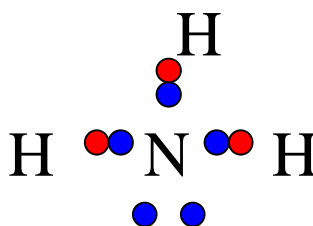
Examples:

1. NH_3 = ammonia. This compound, made from hydrogen and nitrogen, is an important precursor of fertilizers. It is also found in comets and in interstellar space.

We have to combine nitrogen with its five valence electrons with three hydrogens, each with 1 valence electron. Since nitrogen needs three more electrons to fill its shell, it will bond to three hydrogens, which will all be satisfied.

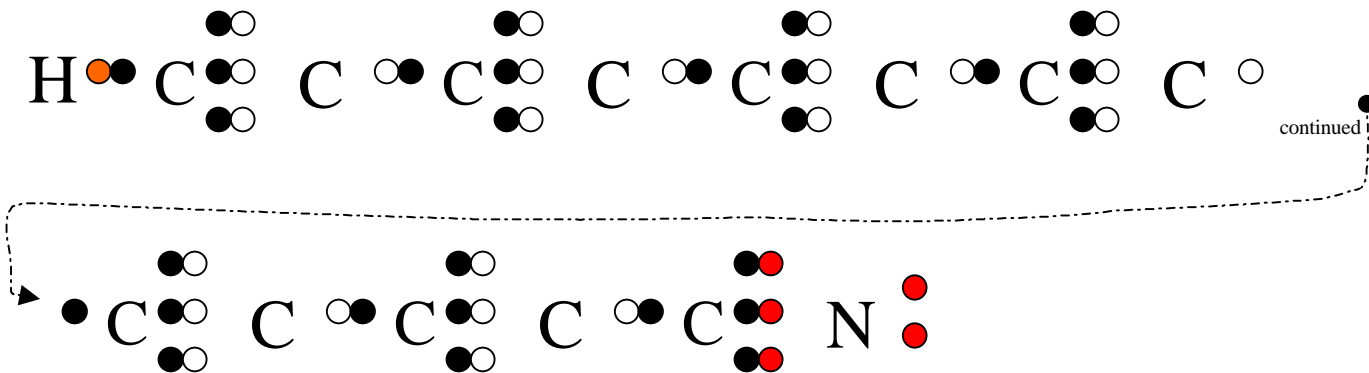


Answer:



2. $C_{13}NH$ = cyanopolyne. This molecule has never been successfully synthesized and does not exist on earth. But it's known to exist near a star at distance of 660 light years from earth. (see *Radiation and Radioactivity. Draganic and al. 1990. p 159*)

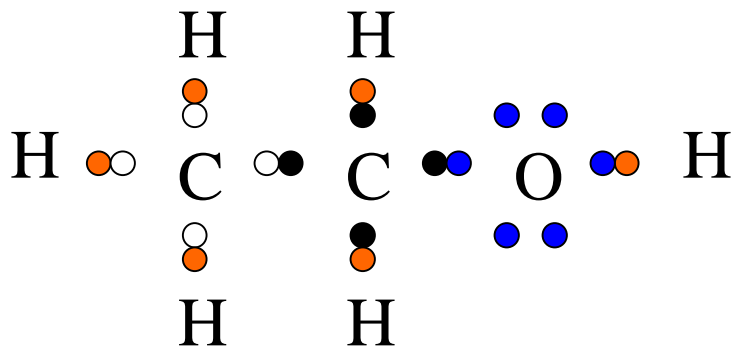
Solution:



3. C_2H_6O

There are two possibilities here. Two different compounds with the same chemical formula are known as *isomers*.

This is ethyl alcohol found in beer, wine etc.



But with the same formula but different structure and different chemical properties is dimethyl ether:

