

The Bohr Model

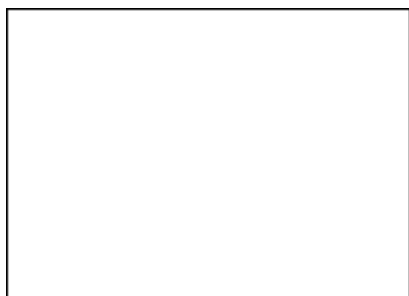
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Niels Bohr - An atom is a small, positively charged _____ surrounded by electrons that travel in _____ around the nucleus—similar in structure to the _____, but with electrostatic forces providing attraction, rather than gravity.

- ☉ Bohr diagrams show how many electrons appear in each _____ around an atom.
 - Electrons in the outermost shell are called _____, the electrons involved in _____.
 - Think of the shells as being 3-D like spheres, not 2-D like circles.
- ☉ Electrons appear in shells in a very predictable manner.
- ☉ There is a maximum of _____ electrons in the first shell, _____ in the 2nd shell, and _____ in the 3rd shell.
 - The _____ number = the number of _____ in the atom.
 - Except for the transition elements, the last digit of the _____ number = the number of electrons in the _____.

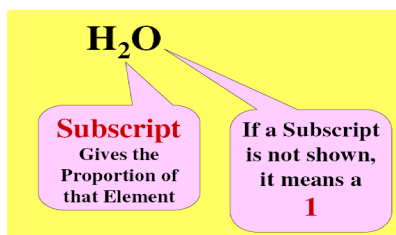
Practice:

Draw a Bohr diagram of a nitrogen atom (atomic number is 7)



The **formula** for a compound shows the proportions of the elements present in the compound.

Compound – A Pure Substance made up of two or more elements combined in a definite formula.



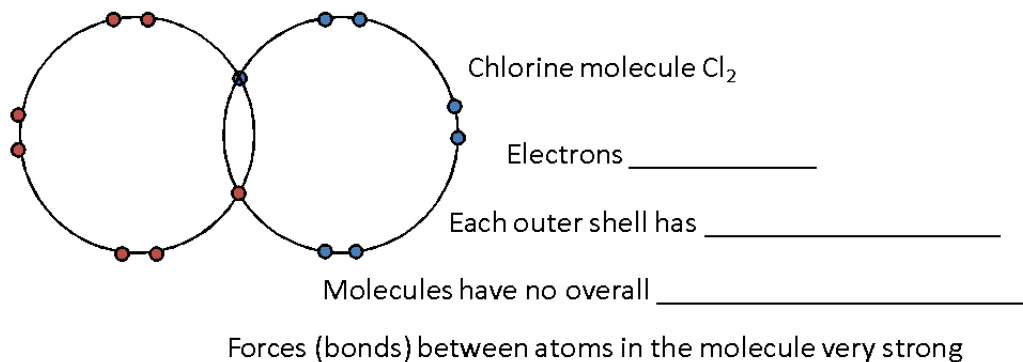
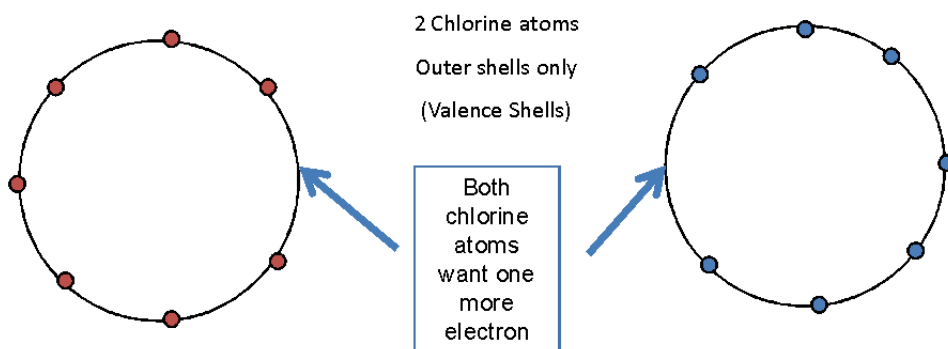
Determine the 'parts' for each element in the compound:

$C_{12}H_{22}O_{11}$	Carbon = _____	Hydrogen = _____	Oxygen = _____
$Li_2Cr_2O_7$	Lithium = _____	Chromium = _____	Oxygen = _____
$(NH_4)_3PO_4$	Nitrogen = _____	Hydrogen = _____	Phosphorus = _____ Oxygen = _____
$Ca(NO_3)_2$	Calcium = _____	Nitrogen = _____	Oxygen = _____

Ionic Vs. Covalent Bonding

- ⊙ Atoms gain or lose electrons (_____), or atoms _____ electrons (_____).
- ⊙ **IONIC BONDS** form when _____ its electrons (cation) away to another (anion)
 - **Between a** _____
- ⊙ **COVALENT BONDS** form when _____ between _____ .
 - Electrons stay with their atom but overlap with other shells.

The Covalent Bond - (showing only the valence electrons)



Draw the valence electrons for the Bohr model to show the sharing of electrons in the molecule F_2 :

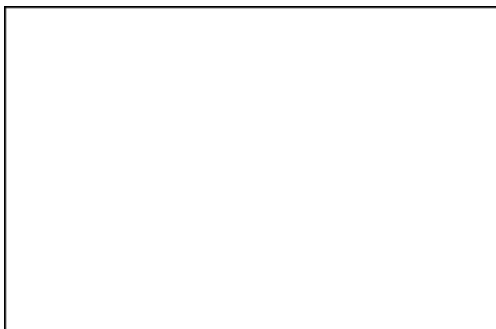
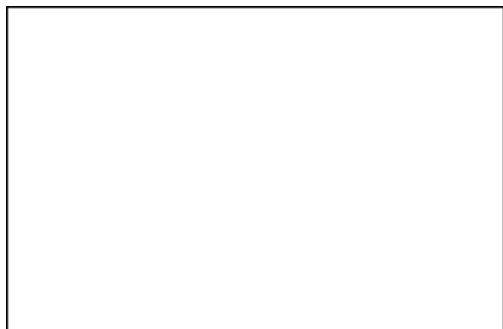
A molecule of Cl_2 and a molecule of F_2 are called _____

- This means two of the same element are bonded together...

Bohr Diagrams

All atoms want to have a _____ configuration. Most atoms want a _____ like noble gases. This means there are _____ electrons in the _____.

Draw fluorine atom and Fluoride Ion



Bohr Diagrams: _____

Water H_2O : Every Oxygen Atom shares one electron with each hydrogen atom.

Every hydrogen now has a full _____ of _____ electrons.

Every oxygen now has a full _____ of _____ electrons.

Bohr Diagram H_2O :

Carbon Dioxide CO_2 : Every Carbon Atom has 4 valence electrons it would like 8 valence electrons. Every oxygen atom has 6 valence electrons and would like to have 8. Carbon shares _____ electrons with each _____ atom.

Bohr Diagram CO_2 :

Ammonia NH_3 : Nitrogen wants to share _____ Valence electrons. Each hydrogen wants to share _____ Valence electron.

Ammonia: all atoms now have _____.

Bohr Diagram NH_3 :

Bohr Diagrams: _____

Calcium Chloride CaCl_2 : A metal Calcium wants to get rid of _____ valence electrons to form an _____ ion. A _____ Chlorine wants to gain _____ valence electron to form a _____ ion.

Now both atoms are _____ with full outer electron shells. (_____)

Bohr Diagram CaCl_2 :