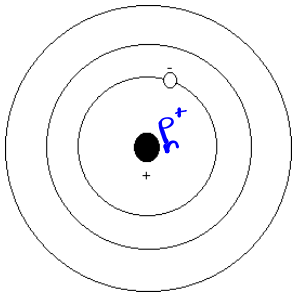
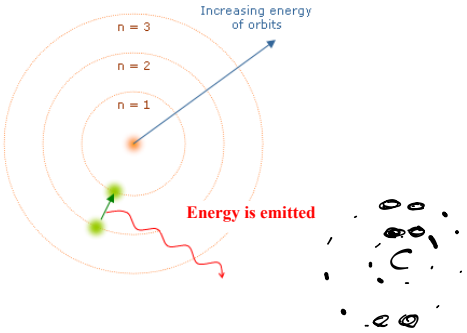
Bohr Theory

1. Each ~~electron~~ has a fixed quantity of energy related to the circular orbit in which the electron is found.



2. Electrons cannot exist between orbits, but they can move to unfilled orbits if a quantum of energy is absorbed or released.

3. The higher the energy level of the electron, the further it is from the nucleus.



4. The maximum number of electrons in the first three energy levels is ~~2,8, and 8~~.

5. An atom with a maximum number of electrons in its outermost energy level (filled) is stable and therefore unreactive.

GROUPS occur in the Periodic Table because:
elements with the same number of electrons in the outer shell have similar chemical properties.

PERIODS occur in the Periodic Table as one shell becomes filled and electrons have to move to a new shell (energy level)

valence electrons - electrons in the highest energy level.
⇒for representative elements, the number of valence electrons is equal to the last digit of the group number

http://www.webelements.com/

Noble Gases (Group 18) are not reactive since their outer energy level is filled and therefore they do not need to gain or lose electrons to other atoms (atoms always try to gain or lose electrons to reach a complete stable outer energy level)

Electron Energy Diagrams

11p+
10e-
1+

8e-
2e-
11p+
sodium ~~atom~~ ion
Na^+

positive ions
↓
cations

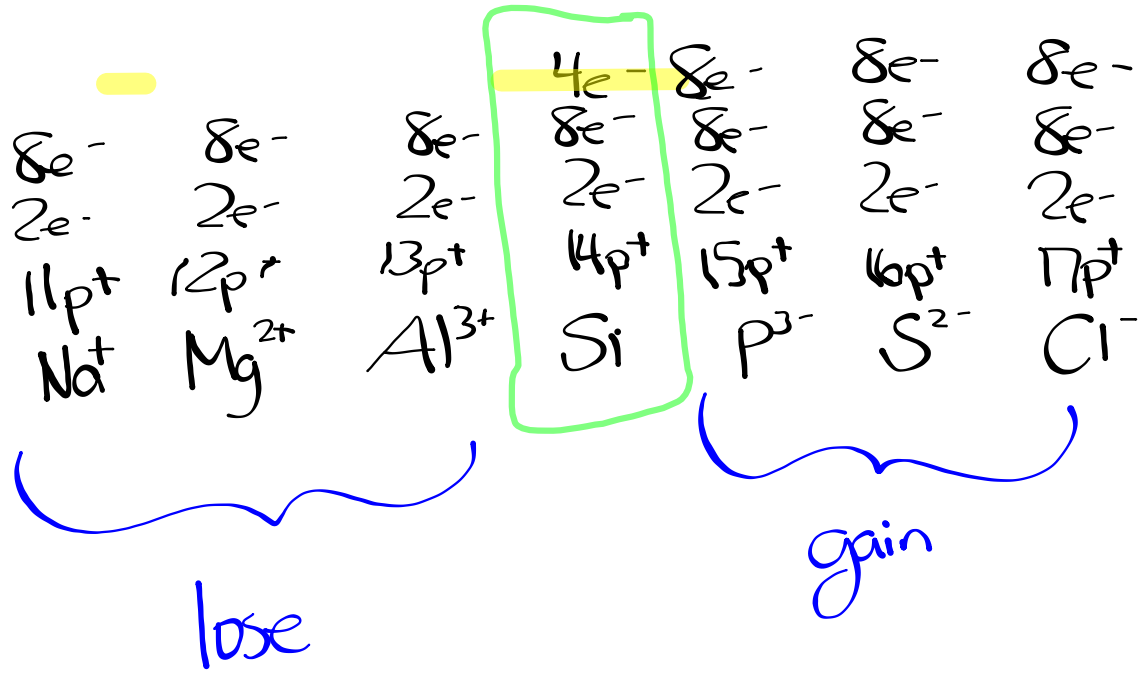
8e-
8e-
2e-
17p+
chloride ~~atom~~ ion
Cl^-

negative ions
↓
anions

name changes
to "-ide"

8e-
8e-
2e-
18p+
argon atom
Ar

2e-
2p+
helium atom
He


8e-
2e-
11p+
Na+
8e-
2e-
12p+
Mg2+
8e-
2e-
13p+
Al3+
4e-
8e-
2e-
14p+
Si
8e-
2e-
15p+
P3-
8e-
2e-
16p+
S2-
8e-
2e-
17p+
Cl-
lose
gain

Ions

Ion - an atom which takes on an electrical charge. Ex. Na^+ or Cl^-

Cations - are usually formed from metallic atoms that lose electrons.
Ex. Ag^+
- positively charged ions
- use the full english name of the atom from which it was formed followed by the word ' ion'

Ex. silver ion

Anions - are usually formed from nonmetallic atoms which have gained an electron.
Ex. F^-
- negatively charged ions
- names of anions are formed by using the english name of the nonmetallic atom as a stem and adding the suffix -ide followed by the word ion.

Ex. fluoride ion

Name	Symbol	+ Protons	− Electrons	Ionic Charge
sulfide ion	S^{2-}	16	18	2-
tellurium atom	Te	52	52	0
cobalt ion	Co^{+}	27	26	1+

Name	Symbol	Protons (+)	Electrons (−)	Ionic Charge
iron ion	Fe^{2+}	26	24	2+
Chromium ion	Cr^{3+}	24	21	3+
Silver atom	Ag	47	47	0
Selenide ion	Se^{2-}	34	36	2−

Today's Assignment

Ions Worksheet