

Ionic Charges and Chemical Families

Date: _____

Name: Key

ALKALI METALS					
Element Name	Standard atomic notation	Bohr-Rutherford Diagram of Atom	# Valence Electrons	Bohr-Rutherford Diagram of Stable Ion	Ionic Charge
lithium	${}^7_3\text{Li}$	$\begin{array}{c} \textcircled{3p} \\ \textcircled{4n} \end{array} \cdot \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \\ 2e^- 1e^-$	1	$\left[\begin{array}{c} \textcircled{3p} \\ \textcircled{4n} \end{array} \begin{array}{c}) \\) \\) \end{array} \right]^{1+} 2e^-$	1+
sodium	${}^{23}_{11}\text{Na}$	$\begin{array}{c} \textcircled{11p} \\ \textcircled{12n} \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \\ 2 \ 8 \ 1$	1	$\left[\begin{array}{c} \textcircled{11p} \\ \textcircled{12n} \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \right]^{1+} 2 \ 8$	1+
potassium	${}^{39}_{19}\text{K}$	$\begin{array}{c} \textcircled{19p} \\ \textcircled{20n} \end{array} \begin{array}{c}) \\) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \\ 2 \ 8 \ 8 \ 1$	1	$\left[\begin{array}{c} \textcircled{19p} \\ \textcircled{20n} \end{array} \begin{array}{c}) \\) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \right]^{1+} 2 \ 8 \ 8$	1+
rubidium	${}^{85}_{37}\text{Rb}$				1+
cesium	${}^{133}_{55}\text{Cs}$				1+
francium	${}^{223}_{87}\text{Fr}$				1+

ALKALINE EARTH METALS					
Element Name	Standard atomic notation	Bohr-Rutherford Diagram of Atom	# Valence Electrons	Bohr-Rutherford Diagram of Stable Ion	Ionic Charge
beryllium	${}^9_4\text{Be}$	$\begin{array}{c} \textcircled{4p} \\ \textcircled{5n} \end{array} \begin{array}{c}) \\) \end{array} \begin{array}{c}) \\) \end{array} \\ 2 \ 2$	2	$\left[\begin{array}{c} \textcircled{4p} \\ \textcircled{5n} \end{array} \begin{array}{c}) \\) \end{array} \right]^{2+} 2$	2+
magnesium	${}^{24}_{12}\text{Mg}$	$\begin{array}{c} \textcircled{12p} \\ \textcircled{12n} \end{array} \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \\ 2 \ 8 \ 2$	2	$\left[\begin{array}{c} \textcircled{12p} \\ \textcircled{12n} \end{array} \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \right]^{2+} 2 \ 8$	2+
calcium	${}^{40}_{20}\text{Ca}$	$\begin{array}{c} \textcircled{20p} \\ \textcircled{20n} \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \begin{array}{c}) \\) \\) \end{array} \\ 2 \ 8 \ 8 \ 2$	2	$\left[\begin{array}{c} \textcircled{20p} \\ \textcircled{20n} \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \begin{array}{c}) \\) \\) \\) \end{array} \right]^{2+} 2 \ 8 \ 8$	2+
strontium	${}^{88}_{38}\text{Sr}$				
barium	${}^{137}_{56}\text{Ba}$				
radium	${}^{226}_{88}\text{Ra}$				

HALOGENS

Element Name	Standard atomic notation	Bohr-Rutherford Diagram of Atom	# Valence Electrons	Bohr-Rutherford Diagram of Stable Ion	Ionic Charge
fluorine	${}^{19}_9\text{F}$	$\begin{array}{c} \textcircled{9p} \\ \textcircled{10n} \\ \text{2 7} \end{array}$	7	$\left[\begin{array}{c} \textcircled{9p} \\ \textcircled{10n} \\ \text{2 8} \end{array} \right]^{1-}$	1-
chlorine	${}^{35}_{17}\text{Cl}$	$\begin{array}{c} \textcircled{17p} \\ \textcircled{18n} \\ \text{2 8 7} \end{array}$	7	$\left[\begin{array}{c} \textcircled{17p} \\ \textcircled{18n} \\ \text{2 8 8} \end{array} \right]^{1-}$	1-
bromine	${}^{80}_{35}\text{Br}$				1-
iodine	${}^{127}_{53}\text{I}$				1-
astatine	${}^{210}_{85}\text{At}$				1-

NOBLE GASES

Element Name	Standard atomic notation	Bohr-Rutherford Diagram of Atom	# Valence Electrons	Bohr-Rutherford Diagram of Stable Ion	Ionic Charge
helium	${}^4_2\text{He}$	$\begin{array}{c} \textcircled{2p} \\ \textcircled{2n} \\ \text{2} \end{array}$	2	n/a (Same as atom) NO ION	∅
neon	${}^{20}_{10}\text{Ne}$	$\begin{array}{c} \textcircled{10p} \\ \textcircled{10n} \\ \text{2 8} \end{array}$	8	n/a	∅
argon	${}^{40}_{18}\text{Ar}$	$\begin{array}{c} \textcircled{18p} \\ \textcircled{22n} \\ \text{2 8 8} \end{array}$	8	n/a	∅
krypton	${}^{84}_{36}\text{Kr}$				∅
xenon	${}^{131}_{54}\text{Xe}$				∅
radon	${}^{222}_{86}\text{Rn}$				∅

METALLIC ELEMENTS

Element Name	Standard atomic notation	Bohr-Rutherford Diagram of Atom	# Valence Electrons	Tendency to Gain or Lose Electrons	Ionic Symbol
sodium	$^{23}_{11}\text{Na}$	$\begin{array}{c} (11p) \\ (12n) \\ 2 \ 8 \ 1 \end{array}$	1	LOSE	Na^+
magnesium	$^{24}_{12}\text{Mg}$	$\begin{array}{c} (12p) \\ (12n) \\ 2 \ 8 \ 2 \end{array}$	2	LOSE	Mg^{2+}
aluminum	$^{27}_{13}\text{Al}$	$\begin{array}{c} (13p) \\ (13n) \\ 2 \ 8 \ 3 \end{array}$	3	LOSE	Al^{3+}
gallium	$^{70}_{31}\text{Ga}$				Ga^{3+}

NONMETALLIC ELEMENTS

Element Name	Standard atomic notation	Bohr-Rutherford Diagram of Atom	# Valence Electrons	Tendency to Gain or Lose Electrons	Ionic Symbol
carbon	$^{12}_6\text{C}$	$\begin{array}{c} (6p) \\ (6n) \\ 2 \ 4 \end{array}$	4	EITHER! (tends to gain) →	C^{4-}
nitrogen	$^{14}_7\text{N}$	$\begin{array}{c} (7p) \\ (7n) \\ 2 \ 5 \end{array}$	5	GAIN	N^{3-}
oxygen	$^{16}_8\text{O}$	$\begin{array}{c} (8p) \\ (8n) \\ 2 \ 6 \end{array}$	6	GAIN	O^{2-}
fluorine	$^{19}_9\text{F}$	$\begin{array}{c} (9p) \\ (9n) \\ 2 \ 7 \end{array}$	7	GAIN	F^{-}