

I																				VIII					
1 H Hydrogen																	2 He Helium								
3 Li Lithium	4 Be Beryllium											5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon								
11 Na Sodium	12 Mg Magnesium											13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulphur	17 Cl Chlorine	18 Ar Argon								
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton								
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon								
55 Cs Cesium	56 Ba Barium	71 Lu Lutetium	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon								
87 Fr Francium	88 Ra Radium	103 Lr Lawrencium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium																	

57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium
89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium

I – Alkali Metals

II – Alkaline Earth Metals

1	H	Hydrogen	2	He	Helium
3	Li	Lithium	4	Be	Beryllium
11	Na	Sodium	12	Mg	Magnesium
19	K	Potassium	20	Ca	Calcium
37	Rb	Rubidium	38	Sr	Strontium
55	Cs	Cesium	56	Ba	Barium
87	Fr	Francium	88	Ra	Radium
21	Sc	Scandium	22	Ti	Titanium
23	V	Vanadium	24	Cr	Chromium
25	Mn	Manganese	26	Fe	Iron
27	Co	Cobalt	28	Ni	Nickel
29	Cu	Copper	30	Zn	Zinc
31	Al	Aluminum	32	Ge	Germanium
33	As	Arsenic	34	Se	Selenium
35	Br	Bromine	36	Kr	Krypton
37	Rb	Rubidium	38	Sr	Strontium
39	Y	Yttrium	40	Zr	Zirconium
41	Nb	Niobium	42	Mo	Molybdenum
43	Tc	Technetium	44	Ru	Ruthenium
45	Rh	Rhodium	46	Pd	Palladium
47	Ag	Silver	48	Cd	Cadmium
49	In	Indium	50	Sn	Tin
51	Sb	Antimony	52	Te	Tellurium
53	I	Iodine	54	Xe	Xenon
55	Cs	Cesium	56	Ba	Barium
57	La	Lanthanum	58	Ce	Cerium
59	Pr	Praseodymium	60	Nd	Neodymium
61	Pm	Promethium	62	Sm	Samarium
63	Eu	Europium	64	Gd	Gadolinium
65	Tb	Terbium	66	Dy	Dysprosium
67	Ho	Holmium	68	Er	Erbium
69	Tm	Thulium	70	Yb	Ytterbium
71	Lu	Lutetium	72	Hf	Hafnium
73	Ta	Tantalum	74	W	Tungsten
75	Re	Rhenium	76	Os	Osmium
77	Ir	Iridium	78	Pt	Platinum
79	Au	Gold	80	Hg	Mercury
81	Tl	Thallium	82	Pb	Lead
83	Bi	Bismuth	84	Po	Polonium
85	At	Astatine	86	Rn	Radon
103	Lr	Lutetium	104	Rf	Rutherfordium
105	Db	Dubnium	106	Sg	Seaborgium
107	Bh	Berkelium	108	Hs	Hassium
109	Mt	Mendelevium			

57	La	Lanthanum	58	Ce	Cerium	59	Pr	Praseodymium	60	Nd	Neodymium	61	Pm	Promethium	62	Sm	Samarium	63	Eu	Europium	64	Gd	Gadolinium	65	Tb	Terbium	66	Dy	Dysprosium	67	Ho	Holmium	68	Er	Erbium	69	Tm	Thulium	70	Yb	Ytterbium
89	Ac	Actinium	90	Th	Thorium	91	Pa	Protactinium	92	U	Uranium	93	Np	Neptunium	94	Pu	Plutonium	95	Am	Americium	96	Cm	Curium	97	Bk	Berkelium	98	Cf	Californium	99	Es	Einsteinium	100	Fm	Fermium	101	Md	Mendelevium	102	No	Nobelium

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3	Li	Lithium	4	Be	Beryllium
11	Na	Sodium	12	Mg	Magnesium
19	K	Potassium	20	Ca	Calcium
37	Rb	Rubidium	38	Sr	Strontium
55	Cs	Cesium	56	Ba	Barium
87	Fr	Francium	88	Ra	Radium
21	Sc	Scandium	22	Ti	Titanium
23	V	Vanadium	24	Cr	Chromium
25	Mn	Manganese	26	Fe	Iron
27	Co	Cobalt	28	Ni	Nickel
29	Cu	Copper	30	Zn	Zinc
31	Al	Aluminum	32	Ge	Germanium
33	As	Arsenic	34	Se	Selenium
35	Br	Bromine	36	Kr	Krypton
53	I	Iodine	54	Xe	Xenon
71	Lu	Lutetium	72	Hf	Hafnium
73	Ta	Tantalum	74	W	Tungsten
75	Re	Rhenium	76	Os	Osmium
77	Ir	Iridium	78	Pt	Platinum
79	Au	Gold	80	Hg	Mercury
81	Tl	Thallium	82	Pb	Lead
83	Bi	Bismuth	84	Po	Polonium
85	At	Astatine	86	Rn	Radon
103	Lr	Lanthanum	104	Rf	Rutherfordium
105	Db	Dubnium	106	Sg	Seaborgium
107	Bh	Berkelium	108	Hs	Hassium
109	Mt	Mendelevium			

III Boron Group

IV Carbon Group

V Nitrogen Group

VI Oxygen Group

VII

VIII

57	La	Lanthanum	58	Ce	Cerium	59	Pr	Praseodymium	60	Nd	Neodymium	61	Pm	Promethium	62	Sm	Samarium	63	Eu	Europium	64	Gd	Gadolinium	65	Tb	Terbium	66	Dy	Dysprosium	67	Ho	Holmium	68	Er	Erbium	69	Tm	Thulium	70	Yb	Ytterbium
89	Ac	Actinium	90	Th	Thorium	91	Pa	Protactinium	92	U	Uranium	93	Np	Neptunium	94	Pu	Plutonium	95	Am	Americium	96	Cm	Curium	97	Bk	Berkelium	98	Cf	Californium	99	Es	Einsteinium	100	Fm	Fermium	101	Md	Mendelevium	102	No	Nobelium

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23	V	Vanadium	24	Cr	Chromium
25	Mn	Manganese	26	Fe	Iron
27	Co	Cobalt	28	Ni	Nickel
29	Cu	Copper	30	Zn	Zinc
31	Al	Aluminum	32	Ge	Germanium
33	As	Arsenic	34	Se	Selenium
35	Br	Bromine	36	Kr	Krypton
37	Rb	Rubidium	38	Sr	Strontium
39	Y	Yttrium	40	Zr	Zirconium
41	Nb	Niobium	42	Mo	Molybdenum
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107	Bh	Berkelium	108	Hs	Hassium
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III Boron Group

IV Carbon Group

V Nitrogen Group

VI Oxygen Group

VII Halogens

VIII Noble Gases

57	La	Lanthanum	58	Ce	Cerium	59	Pr	Praseodymium	60	Nd	Neodymium	61	Pm	Promethium	62	Sm	Samarium	63	Eu	Europium	64	Gd	Gadolinium	65	Tb	Terbium	66	Dy	Dysprosium	67	Ho	Holmium	68	Er	Erbium	69	Tm	Thulium	70	Yb	Ytterbium
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87 Fr Francium	88 Ra Radium	103 Lr Lawrencium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium												

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# Main Group Elements

1 H Hydrogen	= Alkaline Earth Metals																2 He Helium
3 Li Lithium	4 Be Beryllium	Transition Metals										5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon
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Monatomic Gases (single atom gases - He, Ne, Ar, Kr, Xe, Rn)



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Alkali Metals (Group 1)  
Alkaline Earth Metals (Group 2)

Boron Group (Group 13)  
Carbon Group (Group 14)  
Nitrogen Group (Group 15)  
Oxygen Group (Group 16)  
Halogens (Group 17)  
Noble Gases (Group 18)

Transition Metals (Groups 3-10)

Rare Earth Metals (Lanthanide and Actinide series)

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Monatomic Gases:  
All other elements want to be like these gases (see octet rule)

## Rare Earth Metals

57 La Lanthanum	58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium
89 Ac Actinium	90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium

- Monatomic Gases (single atom gases - He, Ne, Ar, Kr, Xe, Rn)
- Diatomic Gases (two atoms per molecule - H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, F<sub>2</sub>, Cl<sub>2</sub>)
- Non-metals
- Metals