- Alkali Met.
- Metal
- Trans. Met.
- Noble Gas
- Chalcogens
- Lanthanide
- Non-Metal
- Halogen
- Actinide
- Metaloids

	I	II											III	IV	V	VI	VI	0
1	1 H 1.0																	2 He 4
2	3 Li 6.9	4 Be 9.0											5 B 10.8	6 C 12	7 N 14	8 O 16	9 F 19	10 Ne 20.2
3	11 Na 23	12 Mg 24.3											13 Al 27	14 Si 28.1	15 P 31	16 S 32.1	17 Cl 35.5	18 Ar 39.9
4	19 K 39.1	20 Ca 40.1	21 Sc 45	22 Ti 47.9	23 V 50.9	24 Cr 52	25 Mn 54.9	26 Fe 55.9	27 Co 58.9	28 Ni 58.7	29 Cu 63.5	30 Zn 65.4	31 Ga 69.7	32 Ge 72.6	33 As 74.9	34 Se 79	35 Br 79.9	36 Kr 83.8
5	37 Rb 85.5	38 Sr 87.6	39 Y 88.9	40 Zr 91.2	41 Nb 92.9	42 Mo 95.9	43 Tc (98)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
6	55 Cs 132.9	56 Ba 137	57 # La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.9	75 Re 186.2	76 Os 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197	80 Hg 200.6	81 Tl 204.4	82 Pb 207.2	83 Bi 209	84 Po (210)	85 At (210)	86 Rn (222)
7	87 Fr (223)	88 Ra 226	89 @ Ac 227	104 Unq (259)	105 Unp (260)	106 Unh (263)	107 Uns (262)	108 108 (265)	109 Une (266)									

Lanthanide # Series													
58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm (145)	62 Sm 150.4	63 Eu 152	64 Gd 157.2	65 Tb 157.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175

Actinide @ Series													
90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np 237.0	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (260)

SHAREWARE VERSION CLICK HERE FOR AN ORDER FORM
Background
Index By Number

Alkali Metals.

The **alkali metals** are the elements CAESIUM, FRANCIUM, LITHIUM, POTASSIUM, RUBIDIUM, and SODIUM. These are the elements that form group I of the periodic table. The alkali metals react violently with water to form strong bases, called alkalies. The alkali metals are monovalent, the outer electron shell consisting of a single electron. This electron is easily shed to form a stable cation that has the electron configuration of an inert gas. The alkali metals readily donate electrons to Halogen atoms to form stable salts. The reactivity of the alkali metals increases with atomic weight, or increasing atom radius, because the outer electron is held less strongly. Recent research has shown that atoms of alkali metals can also gain an electron to form highly reactive anions.

Because of their high reactivity, alkali metals are never found in nature as free elements; instead they occur in compounds such as silicates or chlorides. The alkali metals have low density, low melting point, and high ductility.

A Cation is a positively charged ion

Actinides

The actinides are half of the **Rare Earth Metals**, the others are in the lanthanides

Lanthanide series.

The **Lanthanide series** is the group of chemical elements that follow Lanthanum the periodic table. They are also sometimes called the rare earth metals (because they were originally isolated as oxides, or "earths," and were originally discovered in rare minerals). In comparison with other elements, they are not really rare, except for Promethium (61), which has only radioactive isotopes with short half-lives. Lanthanum itself was so named because it is difficult to isolate (the Greek word lanthanein means "to lurk unseen"). The Lanthanides are found together in nature and are very difficult to separate from each other because they are chemically similar.

In their elemental form, the lanthanides are silvery metals with high melting points. They tarnish slowly in air, except for samarium, europium, and ytterbium, which are much more reactive toward oxygen or moisture.

The lanthanides are half of the **Rare Earth Metals**, the others are in the Actinide seris

Noble Gas

Nobel gas refers to any element of the group of six elements in group 8 of the periodic table. They are Argon, Helium, Krypton, Neon, Radon, and Xenon. Unlike most elements, the noble gases are monatomic. The atoms have stable configurations of electrons, therefore under normal conditions they do not form compounds with other elements.
They were called inert gases until around 1962 when Xenon tetrafluoride, XeF_4, was produced in the laboratory. This was the first report of a stable compound of a noble gas with another single element. Since then other compounds of noble gasses have been produced, including some compounds of Carbon.

Related Topics
Non-Metal Elements
Halogen Elements

Transition Metals

The **Transition metals** are generally hard, strong metals with high melting and boiling points; they are also usually electropositive. That is, they react by tending to lose, rather than gain, electrons. Certain unique properties of the transition elements are related to their d subshell electrons. These properties include variable oxidation states, formation of brightly coloured compounds, tendency to form many complexes, and ferromagnetism and paramagnetism.

Non-Metal Elements

Nonmetals are basically defined as elements that are not metals. Normally excluding the halogens and the noble gasses since these have a "group" of there own.

Their chemical properties are generally:
- They usually have four to eight valence electrons.
- They have high electron affinities. (Except the noble gases)
- They are good oxidizing agents. (Except the noble gases)
- They have hydroxides which are acidic. (Except the noble gases)
- They are electronegative.

Their physical properties generally include:
- They are all insulators (except Carbon (graphite).
- They are brittle, not ductile in their solid state.
- They show no metallic lustre.
- They may be transparent or translucent.
- They have low density.
- They form molecules which consists of atoms covalently bonded; the noble gases are monatomic.

The Halogens

The **halogens** are the elements in group VII of the periodic table. They are Fluorine, Chlorine, Bromine, Iodine and Astatine.

The name Halogen comes from the Greek *Hals*(salt) and *gen*(producing). This is because the halogens readily react with metals to form salts.

Generally the halogens are the most reactive group of non-metals.
They are strong oxidising agents.
The halogens are so reactive that they cannot exist free in nature, indeed, Fluorine is reactive enough to combine with almost all of the known elements, including some of the noble gasses.

The mol is a unit of numbering, along the lines of a million or a thousand.
As there are 1000 things in a thousand of any thing, there are 6E23 things in a mol of anything.

the **I**nternational **U**nion of **P**ure and **A**pplied **C**hemistry

Metalloids.

Metalloids have low electrical conductivities which increase with temperature, the opposite to metals. They have some of the properties of metals and some of the nonmetals. Most have a metallic appearance.
Also called Semi-metals or Semi-conductors.

About Periodic Table

This copy licensed to : Shareware

This periodic table was compiled by Tim Webber.
I cannot be held responsible for any mistakes in this text.
If you find any, please let me know at,
46 Camberton Road
Leighton Buzzard
Beds
LU7 7UP

(c) 1993 Tim Webber

If you want to register, Print out the Orderform and send it to me.
For individual users registration costs 5 pounds, This gets you the
latest version of Table on a 3.5" disk along with some other programs,
and a short printed manual
Schools etc. must buy a site license. Contact me for details

If you want to order a registered copy of Table , without the nag screens , and probably by the time you read this, more background information, please print out this order form and fill it out
To print the form out select "Print topic" from the File menu of Winhelp

When completed it should be sent to me at
46 Camberton Road
Leighton Buzzard
Beds
LU7 7UP

Please send me the latest registered version of Table,

Name ______________________

Address______________________ Phone (______) ___________
____
____
____
____
____

I enclose a cheque made payable to Tim Webber for Five Pounds Sterling.

(3.5" disk only, sorry) I would like 720k DD [ ] disk.
1.4M HD [ ]

Signed ______________________

[You will also receive shareware versions of some of my other software]
[Please take time to fill in the following questions to help me fix any incompatability problems and to know what extra software to give you]

CPU type 286 [ ] Speed 16Mhz [ ] Hard Disk Size (Mb)_______
386 [ ] SX [ ] 20Mhz [ ]
486 [ ] DX [ ] 25Mhz [ ]
586 [ ] 33MHz [ ]
Other ______
DOS Ver 3.x [ ] 4.x [ ] 5.x [ ] 6.x [ ]
Type MSDOS [ ] IBM(PCDOS) [ ] DRDOS [ ] Other __________

Windows Ver 3.0 [ ] 3.1 [ ] 4.x [ ] NT [ ] WFW [ ]

Sound Card [ ] Type _______________

Screen resolution ______ x ______ and colours _______

Metals

The most obvious characteristics of metals are an ability to conduct electricity, an excellent conductivity of heat, and a high level of reflected light from a polished surface, i.e. *metallic*. In addition, most metals deform , rather than shatter, on impact or under pressure. Metals that can be hammered or beaten into sheets are called malleable; those that can be drawn into wire are called ductile. Certain properties, such as hardness and mechanical strength, are not shared by all metals; some metals are actually soft enough to be scratched by a fingernail or deformed by hand, some are liquids at room temperature.

Metals characteristically combine with nonmetals to form ionic compounds in which the metal ion is always positive and the nonmetal ion is always negative.
Their electrical resistance increases as their temperature increases.

Index of elements by Atomic Number

51 Antimony
52 Tellurium
53 Iodine
54 Xenon
55 Caesium
56 Barium
57 Lanthanum
58 Cerium
59 Praseodymium
60 Neodymium
61 Promethium
62 Samarium
63 Europium
64 Gadolinium
65 Terbium
66 Dysprosium
67 Holmium
68 Erbium
69 Thulium
70 Ytterbium
71 Lutetium
72 Hafnium
73 Tantalum
74 Tungsten
75 Rhenium
76 Osmium
77 Iridium
78 Platinum
79 Gold
80 Mercury
81 Thallium
82 Lead
83 Bismuth
84 Polonium
85 Astatine
86 Radon
87 Francium
88 Radium
89 Actinium
90 Thorium
91 Protactinium
92 Uranium
93 Neptunium
94 Plutonium
95 Americium
96 Curium
97 Berkelium
98 Californium
99 Einsteinium
100 Fermium
101 Mendelevium
102 Nobelium
103 Lawrencium
104 Unnilquadium
105 Unnilpentium
106 Unnilhexium

107 Unnilseptium
108 Element 108
109 Unnilennium

Hydrogen (H)

Atomic Number(Z)	1
Atomic Weight(A)	1 g/mol
Mp	14 k
Bp	20 k
Atomic Radius(r)	0.037 nm
Electronic configuration	
1s1	
Alkali Metal	
Density	0.07 g/cm3 @ 20 k

See also Deuterium
Tritium

Deuterium (D)

Atomic Number(Z)	1
Atomic Weight(A)	2 g/mol

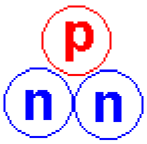
Deuterium is an isotope of Hydrogen.
Occurring naturally at a rate of 0.1%
of the number of Hydrogen atoms.
It consists of a nucleus of 1 Proton and
1 Neutron surrounded by 1 electron.

See also Hydrogen
Tritium

Tritium (T)

Atomic number	1
Atomic Weight	2 g/mol

Tritium is an isotope of Hydrogen.
It consists of nucleus of 1 Proton and 2 Neutrons, surrounded by 1 electron.



B Tritium

See also Hydrogen
Deuterium

Helium (He)

Atomic Number(Z)	2
Atomic Weight(A)	4 g/mol
Mp	1 k(26atm)
Bp	4 k
Atomic Radius(r)	0.05nm
Electronic configuration	
1s2	
Noble gas	
Density	0.15 g/cm3 @ 3 k

Lithium (Li)

Atomic Number(Z)	3
Atomic Weight(A)	6.9 g/mol
Mp	454 k
Bp	1615 k
Atomic Radius(r)	0.157 nm
Electronic configuration	
1s2 2s1	
Alkali Metal	
Density	0.53 g/cm3

Berylium (Be)

Atomic Number(Z)	4
Atomic Weight(A)	9 g/mol
Mp	1551 k
Bp	3243 k
Atomic Radius(r)	0.125 nm
Electronic configuration	
1s2 2s2	
Metal	
Density	1.85 g/cm3

Boron (B)

Atomic Number(Z)	5
Atomic Weight(A)	10.8 g/mol
Mp	2573 k
Bp	2823 k
Atomic Radius(r)	0.09 nm
Electronic configuration	
1s2 2s2 2p1	
metaloid	
Density	2.34 g/cm3

Carbon (graphite) (C)

Atomic Number(Z)	6
Atomic Weight(A)	12 g/mol
Mp	3925-70 k
Bp	5100 k
Atomic Radius(r)	0.077nm
Electronic configuration	
1s2 2s2 2p2	
non-metal	
Density	2.25# g/cm3

See also Carbon (Diamond).

note (#) density is variable.

Carbon (Diamond) (C)

Atomic Number(Z)	6
Atomic Weight(A)	12 g/mol
Mp	3823 k
Bp	5100 k
Atomic Radius(r)	0.077 nm
Electronic configuration	
1s2 2s2 2p2	
non-metal	
Density	3.51 g/cm3

See also Carbon (Graphite)

Nitrogen (N)

Atomic Number(Z)	7
Atomic Weight(A)	14 g/mol
Mp	63 k
Bp	77 k
Atomic Radius(r)	0.075 nm
Electronic configuration	
1s2 2s2 2p3	
non-metal	
Density	0.81 g/cm3 @ 77 k

Oxygen (O)

Atomic Number(Z)	8
Atomic Weight(A)	16 g/mol
Mp	55 k
Bp	90 k
Atomic Radius(r)	0.073 nm
Electronic configuration	
1s2 2s2 2p4	
non-metal	
Density	1.15 g/cm3 @ 77 k

Fluorine (F)

Atomic Number(Z)	9
Atomic Weight(A)	19 g/mol
Mp	53 k
Bp	85 k
Atomic Radius(r)	0.071 nm
Electronic configuration	
1s2 2s2 2p5	
halogen	
Density	1.51 g/cm3 @ 85 k

Neon (Ne)

Atomic Number(Z)	10
Atomic Weight(A)	20.2 g/mol
Mp	25 k
Bp	27 k
Atomic Radius(r)	0.065 nm
Electronic configuration	
1s2 2s2 2p6	
noble gas	
Density	1.2 g/cm3 @ 27 k

Sodium (Na)

Atomic Number(Z)	11
Atomic Weight(A)	23 g/mol
Mp	371 k
Bp	1156 k
Atomic Radius(r)	0.191 nm
Electronic configuration	
1s2 2s2 2p6 3s1	
Alkali Metal	
Density	0.97 g/cm3

Magnesium (Mg)

Atomic Number(Z)	12
Atomic Weight(A)	24.3 g/mol
Mp	922 k
Bp	1380 k
Atomic Radius(r)	0.16 nm

Electronic configuration

1s2 2s2 2p6 3s2

Metal

Density	1.74 g/cm3

Aluminium (Al)

Atomic Number(Z)	13
Atomic Weight(A)	27 g/mol
Mp	933 k
Bp	2740 k
Atomic Radius(r)	0.13 nm

Electronic configuration

1s2 2s2 2p6 3s2 3p1

Metal

Density	2.7 g/cm3

Silicon (Si)

Atomic Number(Z)	14
Atomic Weight(A)	28.1 g/mol
Mp	1683 k
Bp	2628 k
Atomic Radius(r)	.0118 nm

Electronic configuration

1s2 2s2 2p6 3s2 3p2

Metaloid

Density 2.32 g/cm3

Phosphorus(red)(P)

Atomic Number(Z) 15
Atomic Weight(A) 31 g/mol
Mp
Bp
Atomic Radius(r) 0.11 nm
Electronic configuration
1s2 2s2 2p6 3s2 3p3
Non-metal
Density 2.34 g/cm3

See also Phosphorus(White)
See also Phosphorus(Black)

Phosphorus(white)(P)

Atomic Number(Z)	15
Atomic Weight(A)	31 g/mol
Mp	317 k
Bp	553 k
Atomic Radius(r)	0.11 nm
Electronic configuration	
1s2 2s2 2p6 3s2 3p3	
Non-metal	
Density	1.82 g/cm3

See also Phosphorus(red)
See also Phosphorus(Black)

Phosphorus(black)(P)

Atomic Number(Z)	15
Atomic Weight(A)	31 g/mol
Mp	
Bp	
Atomic Radius(r)	0.11 nm
Electronic configuration	
1s2 2s2 2p6 3s2 3p3	
Non-metal	
Density	2.7# g/cm3

See also Phosphorus(White)
See also Phosphorus(Red)

Note (#) Density is variable

Sulphur (Rhombic) (S)

Atomic Number(Z)	16
Atomic Weight(A)	32.1 g/mol
Mp	386 k
Bp	-
Atomic Radius(r)	0.102 nm

Electronic configuration

1s2 2s2 2p6 3s2 3p4

Non-metal

Density	2.07 g/cm3

See also Sulphur(monoclinic)

Sulphur (monoclinic) (S)

Atomic Number(Z)	16
Atomic Weight(A)	32.1 g/mol
Mp	391 k
Bp	718 k
Atomic Radius(r)	0.102 nm

Electronic configuration

1s2 2s2 2p6 3s2 3p4

non-metal

Density	1.96 g/cm3

See also Sulphur(rhombic)

Chlorine (Cl)

Atomic Number(Z)	17
Atomic Weight(A)	35.5 g/mol
Mp	172 k
Bp	238 k
Atomic Radius(r)	0.099 nm

Electronic configuration

$1s^2 2s^2 2p^6 3s^2 3p^5$

Halogen

Density	1.56 g/cm^3 @ 238 k

Argon (Ar)

Atomic Number(Z)	18
Atomic Weight(A)	39.9 g/mol
Mp	84 k
Bp	87 k
Atomic Radius(r)	0.095 nm

Electronic configuration

1s2 2s2 2p6 3s2 3p6

Nobel gas

Density	1.4 g/cm3 @ 87 k

Potassium (K)

Atomic Number(Z)	19
Atomic Weight(A)	39.1 g/mol
Mp	336 k
Bp	1033 k
Atomic Radius(r)	0.235 nm
Alkali metal	
Density	0.86 g/cm3

Calcium (Ca)

Atomic Number(Z)	20
Atomic Weight(A)	40.1 g/mol
Mp	1112 k
Bp	1757 k
Atomic Radius(r)	0.174 nm
Metal	
Density	1.54 g/cm3

Scandium (Sc)

Atomic Number(Z)	21
Atomic Weight(A)	45 g/mol
Mp	1814 k
Bp	3104 k
Atomic Radius(r)	0.144 nm
Transition Metal	
Density	2.99 g/cm3

Titanium (Ti)

Atomic Number(Z)	22
Atomic Weight(A)	47.9 g/mol
Mp	1933 k
Bp	3560 k
Atomic Radius(r)	0.132 nm
Transition Metal	
Density	4.5 g/cm3

Vanadium (V)

Atomic Number(Z)	23
Atomic Weight(A)	50.9 g/mol
Mp	2163 k
Bp	3653 k
Atomic Radius(r)	0.122 nm
Transition Metal	
Density	5.96 g/cm3

Chromium (Cr)

Atomic Number(Z)	24
Atomic Weight(A)	52 g/mol
Mp	2130 k
Bp	2943 k
Atomic Radius(r)	0.117 nm
Transition Metal	
Density	7.2g/cm3

Manganese (Mn)

Atomic Number(Z)	25
Atomic Weight(A)	54.9 g/mol
Mp	1517 k
Bp	2235 k
Atomic Radius(r)	0.139 nm
Transition Metal	
Density	7.2 g/cm3

Iron (Fe)

Atomic Number(Z)	26
Atomic Weight(A)	55.9g/mol
Mp	1808 k
Bp	3023 k
Atomic Radius(r)	0.125 nm
Transition Metal	
Density	7.86 g/cm3

Cobalt (Co)

Atomic Number(Z)	27
Atomic Weight(A)	58.9 g/mol
Mp	1768 k
Bp	3143 k
Atomic Radius(r)	0.126 nm
Transition Metal	
Density	8.9 g/cm3

Nickel (Ni)

Atomic Number(Z)	28
Atomic Weight(A)	58.7 g/mol
Mp	1728 k
Bp	3003 k
Atomic Radius(r)	0.121 nm
Transition Metal	
Density	8.9 g/cm3

Copper (Cu)

Atomic Number(Z)	29
Atomic Weight(A)	63.5 g/mol
Mp	1356 k
Bp	2840 k
Atomic Radius(r)	0.117 nm
Transition Metal	
Density	8.92 g/cm3

Zinc (Zn)

Atomic Number(Z)	30
Atomic Weight(A)	65.4 g/mol
Mp	693 k
Bp	1180 k
Atomic Radius(r)	0.12 nm
Metal	
Density	7.14 g/cm3

Gallium (Ga)

Atomic Number(Z)	31
Atomic Weight(A)	69.7 g/mol
Mp	303 k
Bp	2676 k
Atomic Radius(r)	0.12 nm
Metal	
Density	5.9 g/cm3

Germanium (Ge)

Atomic Number(Z)	32
Atomic Weight(A)	72.6 g/mol
Mp	1210 k
Bp	3103 k
Atomic Radius(r)	0.12 nm
Metaloid	
Density	5.35g/cm3

Arsenic (As)

Atomic Number(Z)	33
Atomic Weight(A)	74.9 g/mol
Mp	1090k(28atm)
Bp	886k(sub)
Atomic Radius(r)	0.122 nm
Metaloid	
Density	5.73 g/cm3

Selenium (Se)

Atomic Number(Z)	34
Atomic Weight(A)	79 g/mol
Mp	490 k
Bp	958 k
Atomic Radius(r)	0.117 nm
Non-Metal	
Density	4.81 g/cm3

Bromine (Br)

Atomic Number(Z)	35
Atomic Weight(A)	79.9 g/mol
Mp	266 k
Bp	332 k
Atomic Radius(r)	0.114 nm
Halogen	
Density	3.12 g/cm3 @ 293 k

Krypton (Kr)

Atomic Number(Z)	36
Atomic Weight(A)	83.8 g/mol
Mp	116 k
Bp	121 k
Atomic Radius(r)	0.11 nm
Noble Gas	
Density	2.15 g/cm3 @ 121 k

Rubidium (Rb)

Atomic Number(Z)	37
Atomic Weight(A)	85.5 g/mol
Mp	312 k
Bp	959 k
Atomic Radius(r)	0.216 nm
Alkali Metal	
Density	1.53 g/cm3

Strontium (Sr)

Atomic Number(Z)	38
Atomic Weight(A)	87.6 g/mol
Mp	1042 k
Bp	1657 k
Atomic Radius(r)	0.191 nm
Metal	
Density	2.6 g/cm3

Yttrium (Y)

Atomic Number(Z)	39
Atomic Weight(A)	88.9 g/mol
Mp	1795 k
Bp	3611 k
Atomic Radius(r)	0.162 nm
Tansition metal	
Density	4.47 g/cm3

Zirconium (Zr)

Atomic Number(Z)	40
Atomic Weight(A)	91.2 g/mol
Mp	2125 k
Bp	4650 k
Atomic Radius(r)	0.145 nm
Tansition metal	
Density	6.49g/cm3

Niobium (Nb)

Atomic Number(Z)	41
Atomic Weight(A)	92.9 g/mol
Mp	2740 k ~
Bp	5015 k
Atomic Radius(r)	0.134 nm
Tansition metal	
Density	8.57 g/cm3

~ uncertain

Molybdenum (Mo)

Atomic Number(Z)	42
Atomic Weight(A)	95.9 g/mol
Mp	2883 k
Bp	5833 k
Atomic Radius(r)	0.129 nm
Tansition metal	
Density	10.2 g/cm3

Technetium (Tc)

Atomic Number(Z)	43
Atomic Weight(A)	99.0 g/mol
Mp	2445 k
Bp	5150 k

Tansition metal

Density	11.50 g/cm3 ~

~ Density was calculated

Ruthenium (Ru)

Atomic Number(Z)	44
Atomic Weight(A)	101.1g/mol
Mp	2583 k
Bp	4173 k
Atomic Radius(r)	nm
Tansition metal	
Density	12.30 g/cm3

Rhodium (Rh)

Atomic Number(Z)	45
Atomic Weight(A)	102.9 g/mol
Mp	2239 k
Bp	4000 k ~
Atomic Radius(r)	0.125 nm
Tansition metal	
Density	12.4 g/cm3

~ Highly uncertain

Palladium (Pd)

Atomic Number(Z)	46
Atomic Weight(A)	106.4 g/mol
Mp	1827 k
Bp	3243 k
Atomic Radius(r)	0.128 nm
Tansition metal	
Density	12.02g/cm3

Silver (Ag)

Atomic Number(Z)	47
Atomic Weight(A)	107.9 g/mol
Mp	1235 k
Bp	2485k
Atomic Radius(r)	0.134 nm
Tansition metal	
Density	10.5 g/cm3

Cadmium (Cd)

Atomic Number(Z)	48
Atomic Weight(A)	112.4 g/mol
Mp	594 k
Bp	1038 k
Atomic Radius(r)	0.141 nm
Metal	
Density	8.64 g/cm3

Indium (In)

Atomic Number(Z)	49
Atomic Weight(A)	114.8 g/mol
Mp	429 k
Bp	2353 k
Atomic Radius(r)	0.15 nm
Metal	
Density	7.30 g/cm3

Tin (White) (Sn)

Atomic Number(Z)	50
Atomic Weight(A)	118.7g/mol
Mp	505 k
Bp	2533 k
Atomic Radius(r)	0.14 nm
Metal	
Density	7.28 g/cm3

See also Tin (Grey)

Tin (Grey) (Sn)

Atomic Number(Z)	50
Atomic Weight(A)	118.7g/mol
Mp	505 k
Bp	2543 k
Atomic Radius(r)	0.14 nm
Metal	
Density	5.75 g/cm3

See also Tin (White)

Antimony (Sb)

Atomic Number(Z)	51
Atomic Weight(A)	121.8 g/mol
Mp	904 k
Bp	2023 k
Atomic Radius(r)	0.143 nm
Metal	
Density	6.68 g/cm3

Tellurium (Te)

Atomic Number(Z)	52
Atomic Weight(A)	127.6 g/mol
Mp	723 k
Bp	1263 k
Atomic Radius(r)	0.135 nm
Metaloid	
Density	6.00 g/cm3

Iodine (I)

Atomic Number(Z)	53
Atomic Weight(A)	126.9 g/mol
Mp	387 k
Bp	457 k
Atomic Radius(r)	0.133 nm
Halogen	
Density	4.93 g/cm3

Xenon (Xe)

Atomic Number(Z)	54
Atomic Weight(A)	131.3g/mol
Mp	161 k
Bp	166 k
Atomic Radius(r)	0.130 nm
Noble Gas	
Density	3.52 g/cm3 @ 164 k

Diamonds may be a Girls best friend, But this version of table is unregistered Shareware.
Register it. See !!!!!! in Serach for more details

See also Carbon (Graphite)

Technetium (Tc)

What a Silly name for an element!!!.
Oh BTW this version of Table is unregistered Shareware.
Register it. See !!!!!! in Serach for more details

Palladium (Pd)

Another Elemenet with a silly name !!!
If you would like to register this product, you will get a copy without these litle bits of nagging!!
See About Table in search for more details

References.

Tables of Physical and Chemical Constants
G Kaye and T Laby

Revised Nuffield Advance Science Book of Data

The Extraordinary Chemistry of Ordinary Things
C Snyder

The Handbook of Chemistry and Physics.
CRC Press

Chemistry in Action
M Freeman

The New Grollier Electronic Encyclopeadia

McGraw Hill Science and Thecnical Reference Set

The Oxford English Dictionary Second Edition on Compact Disc

Chalcogens.

Elements in Group VI are sometimes known as Chalogens. The Group consists of Oxygen and Sulphur (Nonmetals) Selenium and Tellurium (Semiconductors) and Polonium (Radioactive metal). The name of the group is derived from two Greek words meaning Copper and Born. This is because most Copper compounds consist of Copper and one of these elements. Elements with strong affinities for members of this group are called Chalophiles.

Hydrogen bonds occur between atoms of Hydrogen and Nitrogen , Oxygen and Fluorine. The atoms of N, O and F must be in a position where they have at least one non-bonded pair of electrons free. Due to the small sizes of the H atoms and the atom to which it bonds, the two can get fairly close to each other, so that the attractive forces between them approaches 1/10th of a typical covalent bond. Typical Hydrogen bond strengths are in the region of 25kJ/mol compared to around 400kJ/mol for covalent bonds.
Some compounds are affected by Hydrogen bonding to such a great extent, that the expected physical properties of the compound do not occur. Take water for instance. Water should boil at a far lower temperature than it actually does. The presence of Hydrogen bonds increases the attractive forces between molecules so much , that the boiling and melting points are raised significantly. This is due to the fact that water has Two hydrogen atoms and two non bonded pairs of electrons on the Oxygen atom. Thus each molecule can form an average two H-bonds. Hydrogen bonds also account for the high surface tension of water. The molecules on the surface do not have molecules above them to bond to so they bond to those on the surface forming a skin.

The following table shows the ground state electronic configurations of the first 18 elements, Hydrogen to Argon

1	H	1s1
2	He	1s2
3	Li	1s2 2s1
4	Be	1s2 2s2
5	B	1s2 2s2 2p1
6	C	1s2 2s2 2p2
7	N	1s2 2s2 2p3
8	O	1s2 2s2 2p4
9	F	1s2 2s2 2p5
10	Ne	1s2 2s2 2p6
11	Na	1s2 2s2 2p6 3s1
12	Mg	1s2 2s2 2p6 3s2
13	Al	1s2 2s2 2p6 3s2 3p1
14	Si	1s2 2s2 2p6 3s2 3p2
15	P	1s2 2s2 2p6 3s2 3p3
16	S	1s2 2s2 2p6 3s2 3p4
17	Cl	1s2 2s2 2p6 3s2 3p5
18	Ar	1s2 2s2 2p6 3s2 3p6

Super Heavy elements.

SuperHeavy elements are those elements with atomic numbers of greater than 103. Confusion is widespread about their names since 103, 104 and 105 have had their discoveries claimed by one group in the USA and another in Russia. Each group suggested a different name for each element.
The confusion about the names still carries on over ten years since their discovery. In this table I have used what I believe to be the official IUPAC names for these elements. The groups own names are also included.
As far as I know element 108 has not been named yet. Interestingly enough, the IUPAC names for 103-107 & 109 are the only names in the table to be abbreviated to three letters.

Atomic Number	Name	Symbol
104	Unnilquadium	Unq
105	Unnilpentium	Unp
106	Unnilhexium	Unh
107	Unnilseptium	Uns
108	Element 108	---
109	Unnilennium	Une

At the moment no element with atomic number greater than 109 has been claimed, however a group of elements, with atomic numbers around 114, are expected to possess half-lives of the order of a year or longer. Although they have not been discovered experimentally, it is generally believed that the difficulty lies in making these elements, rather than their stability.

The underlying physics responsible for the limited extent of the periodic table is the competition between attractive "nuclear forces" among the protons and neutrons, and the repulsive electrostatic forces among all the positively charged protons. The limit of the periodic table is then set by the process of nuclear fission, which takes place when the disruptive effect of electrostatic forces overcomes the cohesive effect of the nuclear forces.

The picture began to change when, in 1964, a clearer understanding was reached of the relation between fission half-lives and a well-known property of the nucleus called the magic numbers. If the number of protons (or neutrons) in a nucleus is equal to the proton magic number (or neutron magic number), then such a nucleus displays some special features; one example is that it is spherical in shape. Such a nucleus also displays an extra stability against fission. This means that this nucleus would have a longer half-life than would be expected otherwise. A group of stable elements are expected to occur around the proton magic number 114 and the neutron magic number 184.

References on Super Heavy Elements and their names.
"Tables of physical and chemical constants" by G Kaye and T Laby, fifteenth edition, page 180.
"The Extraordinary Chemistry of Ordinary Things" by C.H.Snyder

Transuranium Elements.

Transuranium elements are those elements that follow Uranium in the periodic table. All of these elements are man-made, and all are radioactive due to the fact that their large atoms are unstable. It has been predicted,however, that elements of numbers around 114 should be fairly stable. Elements with Atomic number 93-103 are in the actinide series. Elements with atomic numbers greater than 103 are called the SuperHeavy elements.

A claim for the discovery of a Transuranium element requires a valid nuclear reaction and a means of chemical identification.
Since the radioactive half lives of the larger elements are so small, ingenious methods of separation and identification need to be developed. Because of the small amounts of element made, and the short half lives, some identifications are made with only a few atoms.
Mendelevium for example was identified by isolating just ***five*** atoms in an ion exchange column and assuming properties to close known elements.

Caesium (Cs)

Atomic Number(Z)	55
Atomic Weight(A)	132.9 g/mol
Mp	302 k
Bp	942 k
Alkali metal	
Atomic Radius(r)	0.235 nm
Density	1.88 g/cm3

Barium (Ba)

Atomic Number(Z)	56
Atomic Weight(A)	137.3 g/mol
Mp	998 k
Bp	1913 k
Atomic Radius(r) metal	0.198 nm
Density	3.51 g/cm3

Lanthanum (La)

Atomic Number(Z)	57
Atomic Weight(A)	138.8 g/mol
Mp	1194 k
Bp	3730 k
Atomic Radius(r)	0.169 nm
Transition Metal	
Density	6.14 g/cm3

Cerium (Ce)

Atomic Number(Z)	58
Atomic Weight(A)	140.1 g/mol
Mp	1073 k
Bp	3273 k

Lanthanide

Density	g/cm3

Praseodymium (Pr)

Atomic Number(Z)	59
Atomic Weight(A)	140.9 g/mol
Mp	1208 k
Bp	3273 k

Lanthanide

Density	g/cm3

Neodymium (Nd)

Atomic Number(Z)	60
Atomic Weight(A)	144.2 g/mol
Mp	1297 k
Bp	3373 k

Lanthanide

Density	g/cm3

Promrthium (Pm)

Atomic Number(Z)	61
Atomic Weight(A)	145 g/mol
Mp	1441 k
Bp	3573 k

Lanthanide

Density	g/cm3

Samarium (Sm)

Atomic Number(Z)	62
Atomic Weight(A)	150.4 g/mol
Mp	1323 k
Bp	1873 k

Lanthanide

Density	g/cm3

Europium (Eu)

Atomic Number(Z)	63
Atomic Weight(A)	152 g/mol
Mp	1103 k
Bp	1703 k

Lanthanide

Density	g/cm3

Gadolinium (Gd)

Atomic Number(Z)	64
Atomic Weight(A)	157.2 g/mol
Mp	1603 k
Bp	3173 k

Lanthanide

Density	g/cm3

Terbium (Tb)

Atomic Number(Z)	65
Atomic Weight(A)	157.9 g/mol
Mp	1633 k
Bp	2773 k

Lanthanide

Density	g/cm3

Dysprosium (Dy)

Atomic Number(Z)	66
Atomic Weight(A)	162.5 g/mol
Mp	1683 k
Bp	2873 k

Lanthanide

Density	g/cm3

Holmium (Ho)

Atomic Number(Z)	67
Atomic Weight(A)	164.9 g/mol
Mp	1743 k
Bp	2573 k

Lanthanide

Density	g/cm3

Erbium (Er)

Atomic Number(Z)	68
Atomic Weight(A)	167.3 g/mol
Mp	1793 k
Bp	2873 k

Lanthanide

Density	g/cm3

Thulium (Tm)

Atomic Number(Z)	69
Atomic Weight(A)	168.9 g/mol
Mp	1823 k
Bp	2173 k

Lanthanide

Density	g/cm3

Ytterbium (Yb)

Atomic Number(Z)	70
Atomic Weight(A)	173.0 g/mol
Mp	1097 k
Bp	1773 k

Lanthanide

Density	g/cm3

Lutetium (Lu)

Atomic Number(Z)	71
Atomic Weight(A)	175 g/mol
Mp	1973 k
Bp	3673 k

Lanthanide

Density	g/cm3

Hafnium (Hf)

Atomic Number(Z)	72
Atomic Weight(A)	178.5 g/mol
Mp	2500 k ~
Bp	3730 k
Atomic Radius(r)	0.144 nm
Transition Metal	
Density	13.31 g/cm3

~ Uncertain

Tantalum (Ta)

Atomic Number(Z)	73
Atomic Weight(A)	180.9 g/mol
Mp	3269 k
Bp	5700 k ~
Atomic Radius(r)	0.134 nm
Transition Metal	
Density	16.6 g/cm3

~ Highly uncertain

Tungsten (W)

Atomic Number(Z)	74
Atomic Weight(A)	183.9g/mol
Mp	3683 k~
Bp	5933 k
Atomic Radius(r)	0.13 nm
Transition Metal	
Density	19.35 g/cm3

~ Uncertain

Rhenium (Re)

Atomic Number(Z)	75
Atomic Weight(A)	186.2 g/mol
Mp	3453 k
Bp	5900 k ~
Atomic Radius(r)	0.128 nm
Transition Metal	
Density	20.53 g/cm3

~ Highly uncertain

Osmium (Os)

Atomic Number(Z)	76
Atomic Weight(A)	190.2 g/mol
Mp	2973 k
Bp	> 5570 k
Atomic Radius(r)	0.126 nm
Transition Metal	
Density	22.48 g/cm3

Iridium (Ir)

Atomic Number(Z)	77
Atomic Weight(A)	192.2 g/mol
Mp	1683 k
Bp	4403 k
Atomic Radius(r)	0.126 nm
Transition Metal	
Density	22.42 g/cm3

Platinum (Pt)

Atomic Number(Z)	78
Atomic Weight(A)	195.1 g/mol
Mp	2045 k
Bp	4100 k ~
Atomic Radius(r)	0.129 nm
Transition Metal	
Density	21.45 g/cm3

~ Highly uncertain

Gold (Au)

Atomic Number(Z)	79
Atomic Weight(A)	197.0 g/mol
Mp	1337 k
Bp	3353 k
Atomic Radius(r)	0.134 nm
Transition Metal	
Density	18.88 g/cm3

Mercury (Hg)

Atomic Number(Z)	80
Atomic Weight(A)	200.6 g/mol
Mp	234 k
Bp	630 k
Atomic Radius(r)	0.144 nm
Metal	
Density	13.59 g/cm3

Thallium (Tl)

Atomic Number(Z)	81
Atomic Weight(A)	204.4 g/mol
Mp	577 k
Bp	1730 k ~
Atomic Radius(r)	0.155 nm
Metal	
Density	11.85g/cm3

~ Uncertain

Lead (Pb)

Atomic Number(Z)	82
Atomic Weight(A)	207.2 g/mol
Mp	601 k
Bp	2013 k
Atomic Radius(r)	0.154 nm
Metal	
Density	11.34g/cm3

Bismuth (Bi)

Atomic Number(Z)	83
Atomic Weight(A)	209.0 g/mol
Mp	544 k
Bp	1833 k ~
Atomic Radius(r)	0.152 nm
Metal	
Density	9.8 g/cm3
~ Uncertain	

Polonium (Po)

Atomic Number(Z)	84
Atomic Weight(A)	210 g/mol
Mp	527 k
Bp	1235 k

Metal

Density	9.4 g/cm3

Astatine (At)

Atomic Number(Z)	85
Atomic Weight(A)	210 g/mol
Mp	575 k ~
Bp	610 k ~

Halogen

Density	-- g/cm3

~ Highly uncertain

Radon (Rn)

Atomic Number(Z)	86
Atomic Weight(A)	222 g/mol
Mp	202 k ~
Bp	211 k ~
Atomic Radius(r)	0.145 nm
Noble gas	
Density	4.4 g/cm3 @ 211 k ~

~ Uncertain

Francium (Fr)

Atomic Number(Z)	87
Atomic Weight(A)	233 g/mol
Mp	300 k ~
Bp	950 k ~

Alkali metal

Density	-- g/cm3

~ highly uncertain

Radium (Ra)

Atomic Number(Z)	88
Atomic Weight(A)	226 g/mol
Mp	973 k
Bp	1410 k

Metal

Density	5 g/cm3 ~

~ Highly uncertain.

Actinium (Ac)

Atomic Number(Z)	90
Atomic Weight(A)	232 g/mol
Mp	2023 k
Bp	5060 k

Transition metal

Density	11.7 g/cm3

~ Uncertain

Thorium (Th)

Atomic Number(Z)	90
Atomic Weight(A)	232 g/mol
Mp	2023 k
Bp	5060 k ~

Actinide

Density	11.7 g/cm3

~ Uncertain

Protactinium (Pa)

Atomic Number(Z)	91
Atomic Weight(A)	231.1 g/mol
Mp	1870 k
Bp	4300 k ~

Actinide

Density	15.37 g/cm3

~ Uncertain

Uranium (U)

Atomic Number(Z)	92
Atomic Weight(A)	238 g/mol
Mp	1405 k
Bp	4091 k

Actinide

Density	19.05 g/cm3

Neptunium (Np)

Atomic Number(Z)	93
Atomic Weight(A)	237 g/mol
Mp	913 k
Bp	4173 k

Actinide

Density	g/cm3

Plutonium (Pu)

Atomic Number(Z)	94
Atomic Weight(A)	242 g/mol
Mp	914 k
Bp	3505 k

Actinide

Density	19.84 g/cm3

~ Uncertain

Americium (Am)

Atomic Number(Z)	95
Atomic Weight(A)	243 g/mol
Mp	1263 k
Bp	2873 k

Actinide

Density	g/cm3

Curium (Cm)

Atomic Number(Z)	96
Atomic Weight(A)	247 g/mol

Actinide

Density	g/cm3

Berkelium (Be)

Atomic Number(Z)	97
Atomic Weight(A)	247 g/mol
Mp	1259 k

Actinide

Density	g/cm3

Californium (Cf)

Atomic Number(Z)	98
Atomic Weight(A)	251 g/mol

Actinide

Density	g/cm3

Einsteinium

Atomic Number(Z)	99
Atomic Weight(A)	252 g/mol

Actinide

Density	g/cm3

Fermium (Fm)

Atomic Number(Z)	100
Atomic Weight(A)	257 g/mol

Actinide

Density	g/cm3

Mendelevium (Md)

Atomic Number(Z)	101
Atomic Weight(A)	258 g/mol

Actinide

Density	g/cm3

Nobelium (No)

Atomic Number(Z)	102
Atomic Weight(A)	259 g/mol

Actinide

Density	g/cm3

Lawrencium (Lr)

Atomic Number(Z)	103
Atomic Weight(A)	260 g/mol

Actinide

Density	g/cm3

Unnilquadium (Unq)

Unnilquadium is the first chemical element beyond the Actinides. This element is radioactive and has chemical properties similar to those of Zirconium and Hafnium. It does not occur in nature but has been produced synthetically in the laboratory. In 1964, the Joint Institute for Nuclear Research in Dubna, in the USSR, claimed to have created isotope-260 of element 104, with a half-life of 0.3 seconds. They suggested the element be named Kurchatovium (Ku), In 1969 the Lawrence Berkeley Laboratory, in California, failed in an attempt to repeat the Dubna group's results. Instead they created two other isotopes of element 104. The Americans disputed the Soviet claim to discovery and proposed to name the element 104 Rutherfordium (Rf). In 1971 the Dubna group experimented further and declared that their earlier experiment had produced isotopes 260 and 259 of element 104.

The IUPAC ruled in 1980 that the name of element 104 be **Unnilquadium**, un being Latin for "one," nil for "zero," and quad for "four."

Super Heavy Elements

Unnilpentium (Unp)

Unnilpentium is a radioactive synthetic element. In 1968, scientists at the Joint Institute for Nuclear Research in Dubna, near Moscow, reported the creation of an isotope of element 105. In 1970 they announced that they had created mass number 261 of element 105, with a half-life of about 2 seconds. The Soviets proposed the name Nielsbohrium. A team at the Lawrence Berkeley Laboratory, in California, disputed the Soviet claim. In 1970 the American group produced an isotope of element 105 with the mass number 260. The Americans proposed that the element be named Hahnium(**Ha**).
In 1980 the IUPAC officially named element 105 **Unnilpentium**, which is Latin for "one-zero-five."
Super Heavy Elements

Unnilhexium (Unh)

Unnilhexium is a synthetic radioactive element that was created almost simultaneously by separate groups of scientists in 1974. It is expected to have chemical properties similar to those of Tungsten. The Soviet group at the Joint Institute for Nuclear Research, in Dubna, produced isotopes having mass numbers 259 and 260, with half-lives of 4-10 milliseconds. The American group at the Lawrence Berkeley Laboratory, in California, produced isotope 263, with a half-life of 0.9 seconds.   Neither the Soviet nor the American group had proposed a name for this element. In 1980, the IUPAC named it **Unnilhexium**, which is Latin for "one-zero-six."

Super Heavy Elements

Unnilseptium (Uns)

Unnilseptium is a synthetic radioactive element. Its creation in 1976 was reported in 1977 by Soviet physicist Georgi N. Flerov at the Joint Institute for Nuclear Research in Dubna, near Moscow. Flerov claimed to have produced extremely short-lived nuclei of the element ; the resulting nuclei of element 107 decayed by spontaneous fission in about two milliseconds. Predictions of the chemistry of element 107, with a mass of 261, indicate that it would behave as do other heavy elements in group VIIB of the periodic table.

The IUPAC have named this element **Unnilseptium**, which is Latin for "one-zero-seven."

Super Heavy Elements

Element 108 is a synthetic radioactive chemical element. The synthesis of a nucleus containing 108 protons and 157 neutrons was reported in 1984 by a team of West German researchers. It was formed by the bombardment of lead-208 atoms with iron-58 atoms. The brief existence of the new element was confirmed when it decayed in milliseconds to yield expected products, although the lifetime was longer than predicted.

Super Heavy Elements

At the time of writing I have no information on the IUPAC name for this element. I suspect it will be "Unniloctium

Unnilennium (Une)

Unnilenium is a synthetic radioactive chemical element. Nuclei of the element were identified in 1982 by West German physicists Gottfried Munzenberg, Peter Armbruster, and co-workers at the Gesellschaft fur Schwerionen Forschung at Darmstadt, following bombardment of bismuth 209 by iron 58 ions in their Unilac accelerator. The nuclei of the new element existed for only 0.005 seconds.

Super Heavy Elements

The SI bases are defined as follows

The Metre is the length of the path followed by light in a vacuum during a time interval of 1/299792458 of a second.
The kilogram is the unit of mass; it is equal to the mass of the international prototype of the Kilogram.
The Second is the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the Caesium-133 atom.
The Ampere is the constant current which, if maintained in two parallel, infintely long conducturs of negligable cross section, and placed 1m apart in a vacuum, would produce a force, between those conductors of 2E-7 N.
The Mole is the amount of substance of a system which contais as many elemental entities as there are atoms in 0.012 Kg of Carbon-12

Notation in this document.
To display some numbers , I have used "scientific notation".
This means that you may see numbers written in the form 1E2 or 2.9E-3.
The notatin works like this.
The **E** is short for 10 to the power of... So if I write 1E2, I mean 1 times 10 to the power of 2, or 1x10(Sqaured)=1x100=100.
Thus 2.3E-2 = 2.3x0.01 = 0.023
and 3.4E3 = 3.4x1000 = 3400