Periodic table

The Periodic Table of the Elements

Group	I	II											III	IV	V	VI	VII	0
								1 H Hydrogen 1										4 He Helium 2
	7 Li Lithium 3	9 Be Beryllium 4											11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
	23 Na Sodium 11	24 Mg Magnesium 12											27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulfur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
	85 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	104 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
	133 Cs Caesium 55	137 Ba Barium 56	139 La Lanthanum 57 *	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mecury 80	204 Tl Thallium 81	207 Pb lead 82	209 Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
	Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89 +															

*58-71 Lanthanoid series
+90-103 Actinoid series

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	Pa Protactinium 91	238 U Uranium 92	Np Neptunium 93	Pu Plutonium 94	Am Americium 95	Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium

Key: a X b — a = relative atomic mass; X = atomic symbol; b = proton (atomic) number

Metals

Non metals

Alkali Metals / Group I Elements

→ are called alkali metals because they react with water to form an alkaline solution

$2Li_{(s)} + 2H_2O_{(l)} \rightarrow 2LiOH_{(aq)} + H_{2(g)}$

alkali metal — water — Alkaline solution

(2) Occurance of alkali metals
→ occur as compounds because they are very reactive

(3) Flame of alkali metals
→ Lithium — red flame
→ Sodium — yellow / orange flame
→ Potassium — lilac / Pinkish flame

Storage of alkali metals

→ stored under oil to avoid reacting with air and water

Physical Properties of alkali metals

1. Soft metals to cut
2. Good conductors of electricity and heat
3. Low melting and boiling points

→ Trend in a group – melting point decreases as you go down the group

→ Trend of density – density decreases as you go down the group

- Chemical properties of alkali metals

1. Have one electron in outer most shell which the lose during a reaction
2. They are reducing agents because they lose electrons
3. React with oxygen to form basic oxides

$2Li + O_2 \rightarrow 2Li_2O$

4. React with water to form a hydroxide and hydrogen gas

$2Li_{(s)} + 2H_2O_{(l)} \rightarrow 2LiOH_{(aq)} + H_{2(g)}$

5. React with the group VII elements to form salts

$Na_{(s)} + Cl_{2(g)} \longrightarrow NaCl_{(s)}$

alkali metal — Halogen — salt

→ Reaction of alkali metals increases down the group because the outermost electron is far from the nucleus of the atom for elements with larger atomic number in the group