

LABORT

The periodic table

An ELEMENT is a substance that consists of atoms of one type only. The 92 elements that occur naturally, and the 17 elements created artificially, are often arranged into a chart called the periodic table. Each element is defined by its atomic number- the number of protons in the nucleus of each of its atoms (it is also the number of electrons present). Atomic number increases along each row. (period) and down each column(group). The shape of the table is determined by the way in which electrons arrange themselves around the nucleus : the positioning of elements in order of increasing atomic number brings together atoms with a similar pattern of orbiting electrons (orbitals). These appear in blocks. Electrons occupy shells of a certain energy (see pp. 308-309). Periods are ordered according to the filling of successive shells with electrons, while groups reflects the number of electrons in the outer shell (valency electrons). These outer electrons are important-they decide the chemical properties of the atom. Elements that appear in the same group have similar properties because they have the same number of electrons in their outer shell. Elements in Group 4 have "filled shells", where the outer shell holds its maximum number of electrons and are stable. Atoms of Group 1 elements have just one electrons in their outer shell. This makes them unstable - and ready to react with other substance.

Atomic Number	21	45.0	3	Oxidation State
BP in °C	-2831	1541		
MP in °C	0.54	1.85	3.0	
Densifying cm ³	0.0899	2.2	1.2	
Electronegativity				
Chemical Symbol	Sc			
Electronic Configuration	(Ar)3d ¹ 4s ²			
Chemical Symbol	Scandium			



DIAMOND

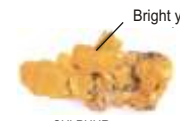


GRAPHITE

ALLOTROPES OF CARBON
Some elements exist in more than one form-these are known as allotropes. Carbon powder, graphite and diamond are allotropes of carbon. They all consist of carbon atoms, but have very different physical properties.



CARBON POWDER



SULPHUR : GROUP 6 SOLID NON-METALS



IODINE : GROUP 7 SOLID NON-METAL

Group I																		Group II																		1st transition metals										2nd transition metals										3rd transition metals										Group III										Group IV										Group V										Group VI										Group VII										Group 0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
Hydrogen																		Lithium																		Sodium																		Potassium																		Rubidium																		Cesium																		Francium																		Magnesium																		Calcium																		Strontium																		Barium																		Radium																		Scandium																		Titanium																		Vanadium																		Chromium																		Manganese																		Iron																		Cobalt																		Nickel																		Copper																		Zinc																		Aluminum																		Silicon																		Phosphorus																		Sulphur																		Chlorine																		Bromine																		Iodine																		Astatine																		Helium																		Neon																		Argon																		Krypton																		Xenon																		Radon																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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METALS AND NON-METALS
Elements at the left-hand side of each period are metals. Metals easily lose electrons and form positive ions. Non-metals, on the right of a period, tend to become negative ions. Semi-metals which have properties of both metals and non-metals, are between the two.



SODIUM : GROUP 1 METAL



MAGNESIUM : GROUP 2 METAL



CHROMIUM : 1ST TRANSITION METAL



GOLD : 3RD TRANSITION METAL



TIN : GROUP 4 POOR METAL



ANTIMONY : GROUP 5 SEMI-METAL



NEON : GROUP 0 COLOURLESS GAS

- TYPES OF ELEMENT KEY :**
- Alkali metals
 - Actinides
 - Alkaline earth metals
 - Poor metals
 - Transition metals
 - Semi-metals
 - Lanthanides (rare earth)
 - Non-metals
 - Noble gases
 - Radioactive metals
 - PLUTONIUM ACTINIDE SERIES METAL

57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Lanthanum	Cerium	Praseodymium	Neodymium	Promethium	Samarium	Europium	Gadolinium	Terbium	Dysprosium	Holmium	Erbium	Thulium	Ytterbium	Lutetium
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
Actinium	Thorium	Protactinium	Uranium	Neptunium	Plutonium	Americium	Curium	Berkelium	Californium	Einsteinium	Fermium	Mendelevium	Nobelium	Lawrencium

f-block