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The S-Block Element: S Block Elements, Periodic Trends in Properties of Elements (For CBSE, ICSE, IAS, NET, NRA 2022)

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S-block elements

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 Sulfur	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	57 La Lanthanum	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	89 Ac Actinium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Ds Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson
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				
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	103 Lr Lawrencium				

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- The group 1 and group 2 elements of the periodic table are called the s-block elements.

- The group 1 elements are alkali metals, and the group 2 elements are alkaline earth metals
- They are named so because of the alkaline nature of the hydroxides and oxides.
- Alkaline earth metals are characterized by two s-electrons, whereas alkali metals by one s-electron in the valence shell of their atoms.
- These metals form mono positive and dispositive ions and are extremely reactive.

S Block Elements

- The s block elements having only one electron in their s-orbital are called group one or alkali metals whereas the s block elements having two electrons filling their s-orbital are called group two or alkaline earth metals.
- The **s-block** in the periodic table of **elements** occupies the alkali metals and alkaline earth metals, also known as groups 1 and 2.
- The electrons present in an atom occupy various sub-orbitals of available energy levels in the order of increasing energy.
- The last electron of an atom may find itself in either of the **s, p, d, and f subshells**.
- Helium is also part of the **s block**. The principal quantum number “n” fills the s orbital.
- Accordingly, the elements of the atom having their last valence electron present in the s-suborbital are called the s block elements.

Periodic Trends in Properties of Elements

Periodic property	Trend in	
	groups	periods
	From top to bottom	From left to right
Valency		
Atomic radius	Increasing	Decreasing
Ionisation energy	Decreasing	Increasing
Electron affinity	Decreasing	Increasing
Electronegativity	Decreasing	Increasing
Electropositivity	Increasing	Decreasing
Metallic nature	Increasing	Decreasing
Non-Metallic nature	Decreasing	Increasing

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- Periodic trends are specific patterns in the properties of chemical elements that are revealed in the periodic table of elements.
- Major periodic trends include electro negativity, ionization energy, electron affinity, atomic radii, ionic radius, metallic character, and chemical reactivity.
- **Alkali metal** – These metals are silvery-white, low melting, soft and highly reactive.
- Ionic size as well as the atomic size increases downs the group. On the other hand, the ionization enthalpies decrease down the group.
- These compounds are mostly ionic.
- Hydroxides and oxides dissolve in water to form strong alkalies. Some compounds of sodium are sodium chloride, sodium hydrogen carbonate, etc.
- Manufacturing of Sodium hydroxide is done by the Castner-Kellner process and manufacturing of sodium carbonate is done by the Solvay process.

- **Alkaline earth metals** – Metals have increased cationic charges. Their ionic size, as well as atomic size, is reduced.
- Hydroxides and oxides of alkaline earth metals are less basic.
- Some compounds of calcium are calcium carbonate, calcium hydroxide, etc.
- **Diagonal relationship** – The first element of group 1 and the second element in group 2 show similar properties i.e. Lithium from group 1 and Beryllium in group 2.
- So, similarities are called diagonal relationship.

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