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Periodic Table of The Elements

Periods

Groups ⟷

1A 1												3A 13	4A 14	5A 15	6A 16	7A 17	8A 18
1 H (G) 1.01	2A 2					# of protons Element (physical state at STP) Atomic Weight											2 He (G) 4.00
3 Li (S) 6.94	4 Be (S) 9.01											5 B (S) 10.81	6 C (S) 12.01	7 N (G) 14.01	8 O (G) 16.00	9 F (G) 19.00	10 Ne (G) 20.18
11 Na (S) 22.99	12 Mg (S) 24.31	3B 3	4B 4	5B 5	6B 6	7B 7	8	8B 9	10	1B 11	2B 12	13 Al (S) 26.98	14 Si (S) 28.09	15 P (S) 30.97	16 S (S) 32.07	17 Cl (G) 35.45	18 Ar (G) 39.95
19 K (S) 39.10	20 Ca (S) 40.08	21 Sc (S) 44.96	22 Ti (S) 47.87	23 V (S) 50.94	24 Cr (S) 52.00	25 Mn (S) 54.94	26 Fe (S) 55.85	27 Co (S) 58.93	28 Ni (S) 58.69	29 Cu (S) 63.55	30 Zn (S) 65.39	31 Ga (S) 69.72	32 Ge(S) 72.64	33 As (S) 74.92	34 Se (S) 78.96	35 Br (L) 79.90	36 Kr (G) 83.80
37 Rb (S) 85.47	38 Sr (S) 87.62	39 Y (S) 88.91	40 Zr (S) 91.22	41 Nb (S) 92.91	42 Mo (S) 95.94	43 Tc (L) [98]	44 Ru (S) 101.07	45 Rh (S) 102.91	46 Pd (S) 106.42	47 Ag (S) 107.87	48 Cd (S) 112.41	49 In (S) 114.82	50 Sn (S) 118.71	51 Sb (S) 121.76	52 Te (S) 127.60	53 I (S) 126.90	54 Xe (G) 131.29
55 Cs (S) 132.91	56 Ba (S) 137.33	*	72 Hf (S) 178.49	73 Ta (S) 180.95	74 W (S) 183.84	75 Re (S) 186.21	76 Os (S) 190.23	77 Ir (S) 192.22	78 Pt (S) 195.08	79 Au (S) 196.97	80 Hg (L) 200.59	81 Tl (S) 204.38	82 Pb (S) 207.2	83 Bi (S) 208.98	84 Po (S) [209]	85 At (S) [210]	86 Rn (G) [222]
87 Fr (S) [223]	88 Ra (S) [226]	~	104 Rf (X) [267]	105 Db (X) [268]	106 Sg (X) [271]	107 Bh (X) [272]	108 Hs (X) [270]	109 Mt (X) [276]	110 Ds (X) [281]	111 Rg (X) [280]	112 Cn (X) [285]	113 Nh (X) [284]	114 Fl (X) [284]	115 Mc (X) [288]	116 Lv (X) [289]	117 Ts (X) [293]	118 Og (X) [294]

Lanthanide Series *	57 La (S) 138.91	58 Ce (S) 140.12	59 Pr (S) 140.91	60 Nd (S) 144.24	61 Pm (S) [145]	62 Sm (S) 150.36	63 Eu (S) 151.97	64 Gd (S) 157.25	65 Tb (S) 158.93	66 Dy (S) 162.50	67 Ho (S) 164.93	68 Er (S) 167.26	69 Tm (S) 168.93	70 Yb (S) 173.04	71 Lu (s) 174.97
Actinide Series ~	89 Ac (S) [227]	90 Th (S) 232.04	91 Pa (S) 231.04	92 U (S) 238.03	93 Np (S) [237]	94 Pu (S) [244]	95 Am (S) [243]	96 Cm (S) [247]	97 Bk (S) [247]	98 Cf (S) [251]	99 Es (S) [252]	100 Fm (S) [257]	101 Md (S) [258]	102 No (S) [259]	103 Lr (S) [262]

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Periodic Table Key

- Group labels 1, 2, 3, etc. are recommended by the International Union of Pure and Applied Chemistry (IUPAC); the labels 1A, 2A, 3B, etc. are more common American usage.
- Atomic masses in brackets are the most stable isotope of radioactive elements.
- The physical states of the elements at STP (standard temperature, 0° C, and standard pressure, 1 atm) are either S (solid), L (liquid), or G (gas). X designates synthetically prepared elements.
- Elements in group 1A (except H) are alkali metals, in 2A are alkaline earth metals, in 3B—2B are transition metals, in 8A are noble (rare) gases, and in 7A (except At) are halogens. Elements with bold borders are metalloids, underlined

Actinium	Ac	Copper	Cu	Iron	Fe	Osmium	Os	Silver	Ag
Aluminum	Al	Curium	Cm	Krypton	Kr	Oxygen	O	Sodium	Na
Americium	Am	Darmstadtium	Ds	Lanthanum	La	Palladium	Pd	Strontium	Sr
Antimony	Sb	Dubnium	Db	Lawrencium	Lr	Phosphorus	P	Sulfur	S
Argon	Ar	Dysporosium	Dy	Lead	Pb	Platinum	Pt	Tantalum	Ta
Arsenic	As	Einsteinium	Es	Lithium	Li	Plutonium	Pu	Technetium	Tc
Astatine	At	Erbium	Er	Livermorium	Lv	Polonium	Po	Tellurium	Te
Barium	Ba	Europium	Eu	Lutetium	Lu	Potassium	K	Tennessine	Ts
Berkelium	Bk	Fermium	Fm	Magnesium	Mg	Praseodymium	Pr	Terbium	Tb
Beryllium	Be	Flerovium	Fl	Manganese	Mn	Promethium	Pm	Thallium	Tl
Bismuth	Bi	Fluorine	F	Meitnerium	Mt	Protactinium	Pa	Thorium	Th
Bohrium	Bh	Francium	Fr	Mendelevium	Md	Radium	Ra	Thulium	Tm
Boron	B	Gadolinium	Gd	Mercury	Hg	Radon	Rn	Tin	Sn
Bromine	Br	Gallium	Ga	Molybdenum	Mo	Rhenium	Re	Titanium	Ti
Cadmium	Cd	Germanium	Ge	Moscovium	Mc	Rhodium	Rh	Tungsten	W
Calcium	Ca	Gold	Au	Neodymium	Nd	Roentgenium	Rg	Uranium	U
Californium	Cf	Hafnium	Hf	Neon	Ne	Rubidium	Rb	Vanadium	V
Carbon	C	Hassium	Hs	Neptunium	Np	Ruthenium	Ru	Xenon	Xe
Cerium	Ce	Helium	He	Nickel	Ni	Rutherfordium	Rf	Ytterbium	Yb
Cesium	Cs	Holmium	Ho	Nihonium	Nh	Samarium	Sm	Yttrium	Y
Chlorine	Cl	Hydrogen	H	Niobium	Nb	Scandium	Sc	Zinc	Zn
Chromium	Cr	Indium	In	Nitrogen	N	Seaborgium	Sg	Zirconium	Zr
Cobalt	Co	Iodine	I	Nobelium	No	Selenium	Se		
Copernicium	Cn	Iridium	Ir	Oganesson	Og	Silicon	Si		

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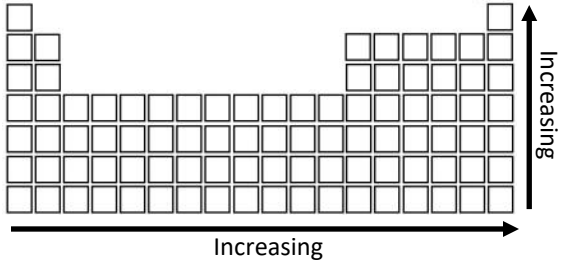
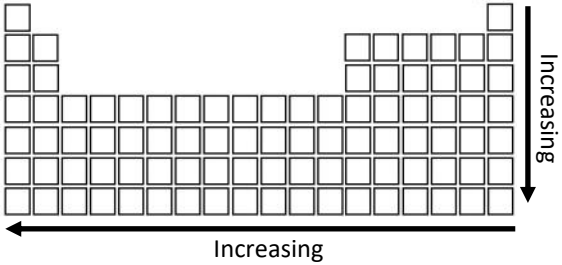
Periodic Table Trends

Electronegativity



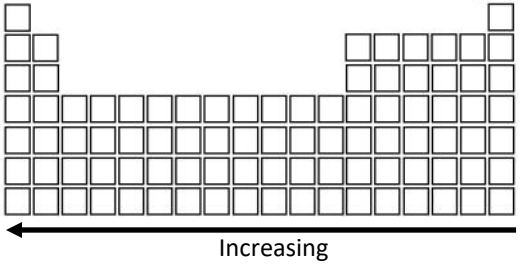
Electronegativity is measured on a unitless scale that ranges from 0.7 to 4.0 that represents the likelihood of an atom attracting an electron. Noble gases are assigned a value of 0 as they do not attract electrons.

Metallic Character



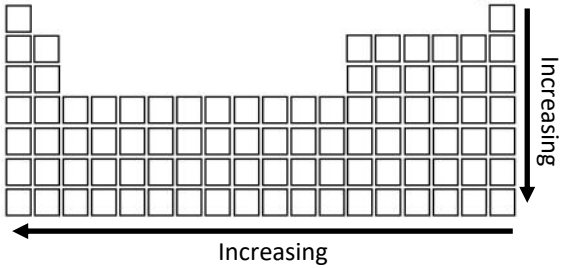
Metallic character describes how much an element exhibits the physical and chemical properties of metals.

Atomic Radius



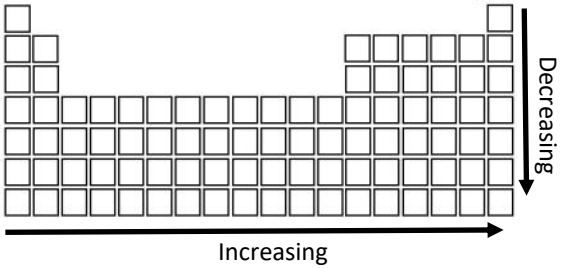
The atomic radius is a physical measurement of the distance from the center of an atom to the outer shell of electrons.

Ionic Radius



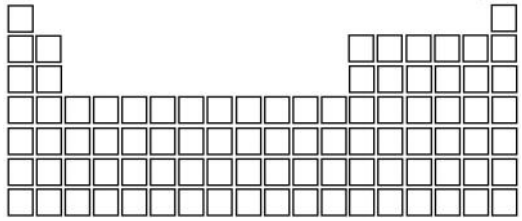
Ionic radius follows the same trend as the atomic radius. However, in most cases, nonmetals form anions and metals form cations, and the difference in charge affects the radius. Therefore, nonmetals and metals must be considered independent of each other.

Ionization Energy



Ionization energy is the amount of energy (kJ/mol) required to remove an electron from the valence shell of the atom. The value also increases when removing subsequent electrons within the atom. Exceptions: Groups 3A and 6A have lower ionization energies as compared to groups 2A and 5A.

Lattice Energy



Lattice energy (kJ/mol) describes the energy that is released when ions combine to form a compound. Both an increase in an atom's charge, and a decrease in atomic radius will lead to an increase in lattice energy.

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