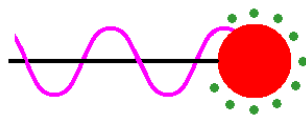


Periodic Table of the Elements with energies of X-ray absorption edges (E_K, E_{L-III} in keV) and neutron absorption cross sections ($\sigma_{na, th}$ in barn)

2017_1b



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Z, proton number
↓

6 12.011 ← Mass
C ← Symbol (+ isotope)
Carbon ← Name
 $E_K: 0.2842$ ← K-edge (keV) X-ray-abs.
 $E_{L-III}: 0.033$ ← L-edge (keV) X-ray-abs.
 $\sigma_{na}: 0.0035$ ← N-absorption cross section

1 (I) 1 1.00794 H Hydrogen $E_K: 0.0136$ $\sigma_{na}: 0.3326$																	18 (VIII) 2 4.0026 He Helium $E_K: 0.0246$ $\sigma_{na}: 0.00747$		
3 6.941 Li Lithium $E_K: 0.0547$ $E_L: 70.5$	4 9.0122 Be Beryllium $E_K: 0.1115$ $E_L: 0.0076$																	10 20.180 Ne Neon $E_K: 0.867$ $E_{L-III}: 0.0216$ $\sigma_{na}: 0.039$	
11 22.990 Na Sodium $E_K: 1.0721$ $E_{L-III}: 0.53$	12 24.305 Mg Magnesium $E_K: 1.3050$ $E_{L-III}: 0.0492$ $\sigma_{na}: 0.063$	3 (III B)	4 (IV B)	5 (V B)	6 (VI B)	7 (VII B)	8 (VIII)	9 (VIII)	10 (VIII)	11 (I B)	12 (II B)	5 10.811 B Boron $E_K: 0.188$ $E_L: 767$	6 12.011 C Carbon $E_K: 0.2842$ $E_{L-III}: 0.033$ $\sigma_{na}: 0.0035$	7 14.007 N Nitrogen $E_K: 0.4099$ $E_{L-III}: 0.0373$ $\sigma_{na}: 1.9$	8 15.999 O Oxygen $E_K: 0.537$ $E_{L-III}: 0.00416$ $\sigma_{na}: 0.00019$	9 18.998 F Fluorine $E_K: 0.686$ $E_{L-III}: 0.045$ $\sigma_{na}: 0.0096$	16 32.065 S Sulfur $E_K: 2.4720$ $E_{L-III}: 0.1625$ $\sigma_{na}: 0.53$	17 35.453 Cl Chlorine $E_K: 2.8224$ $E_{L-III}: 0.2000$ $\sigma_{na}: 33.5$	18 39.948 Ar Argon $E_K: 3.2029$ $E_{L-III}: 0.2484$ $\sigma_{na}: 0.675$
19 39.098 K Potassium $E_K: 3.6074$ $E_{L-III}: 0.2946$ $\sigma_{na}: 2.1$	20 40.078 Ca Calcium $E_K: 4.0381$ $E_{L-III}: 0.3462$ $\sigma_{na}: 0.43$	21 44.956 Sc Scandium $E_K: 4.4928$ $E_{L-III}: 0.3987$ $\sigma_{na}: 27.5$	22 47.867 Ti Titanium $E_K: 4.9664$ $E_{L-III}: 0.4538$ $\sigma_{na}: 6.09$	23 50.942 V Vanadium $E_K: 5.4651$ $E_{L-III}: 0.5121$ $\sigma_{na}: 5.08$	24 51.996 Cr Chromium $E_K: 5.9892$ $E_{L-III}: 0.5741$ $\sigma_{na}: 3.05$	25 54.938 Mn Manganese $E_K: 6.5390$ $E_{L-III}: 0.6387$ $\sigma_{na}: 13.3$	26 55.845 Fe Iron $E_K: 7.1120$ $E_{L-III}: 0.7068$ $\sigma_{na}: 2.56$	27 58.933 Co Cobalt $E_K: 7.7089$ $E_{L-III}: 0.7781$ $\sigma_{na}: 37.18$	28 58.693 Ni Nickel $E_K: 8.3328$ $E_{L-III}: 0.8550$ $\sigma_{na}: 4.49$	29 63.546 Cu Copper $E_K: 8.9789$ $E_{L-III}: 0.9320$ $\sigma_{na}: 3.78$	30 65.409 Zn Zinc $E_K: 9.6586$ $E_{L-III}: 1.0197$ $\sigma_{na}: 1.11$	31 69.723 Ga Gallium $E_K: 10.3671$ $E_{L-III}: 1.1154$ $\sigma_{na}: 2.75$	32 72.64 Ge Germanium $E_K: 11.1031$ $E_{L-III}: 1.2167$ $\sigma_{na}: 2.2$	33 74.922 As Arsenic $E_K: 11.8667$ $E_{L-III}: 1.3231$ $\sigma_{na}: 4.5$	34 78.96 Se Selenium $E_K: 12.6578$ $E_{L-III}: 1.4358$ $\sigma_{na}: 11.7$	35 79.904 Br Bromine $E_K: 13.4737$ $E_{L-III}: 1.5499$ $\sigma_{na}: 6.9$	36 83.798 Kr Krypton $E_K: 14.3256$ $E_{L-III}: 1.6749$ $\sigma_{na}: 25$		
37 85.468 Rb Rubidium $E_K: 15.1997$ $E_{L-III}: 1.8044$ $\sigma_{na}: 0.38$	38 87.62 Sr Strontium $E_K: 16.1046$ $E_{L-III}: 1.9396$ $\sigma_{na}: 1.28$	39 88.906 Y Yttrium $E_K: 17.9976$ $E_{L-III}: 2.0800$ $\sigma_{na}: 1.28$	40 91.224 Zr Zirconium $E_K: 22.1172$ $E_{L-III}: 2.2223$ $\sigma_{na}: 0.185$	41 91.906 Nb Niobium $E_K: 18.9856$ $E_{L-III}: 2.3705$ $\sigma_{na}: 1.15$	42 95.94 Mo Molybdenum $E_K: 19.9995$ $E_{L-III}: 2.5202$ $\sigma_{na}: 2.48$	43 99.906 Tc Technetium $E_K: 21.0440$ $E_{L-III}: 2.6769$ $\sigma_{na}: 20$	44 101.07 Ru Ruthenium $E_K: 22.1172$ $E_{L-III}: 2.8379$ $\sigma_{na}: 2.56$	45 102.91 Rh Rhodium $E_K: 23.2199$ $E_{L-III}: 3.0038$ $\sigma_{na}: 144.8$	46 106.42 Pd Palladium $E_K: 24.3503$ $E_L: 3.1733$ $\sigma_{na}: 6.9$	47 107.87 Ag Silver $E_K: 25.5140$ $E_{L-III}: 3.3511$ $\sigma_{na}: 63.3$	48 112.41 Cd Cadmium $E_K: 26.7112$ $E_{L-III}: 3.5375$ $\sigma_{na}: 2520$	49 114.82 In Indium $E_K: 27.9399$ $E_{L-III}: 3.7301$ $\sigma_{na}: 193.8$	50 118.71 Sn Tin $E_K: 29.2001$ $E_{L-III}: 3.9288$ $\sigma_{na}: 0.626$	51 121.76 Sb Antimony $E_K: 30.4912$ $E_{L-III}: 4.1322$ $\sigma_{na}: 4.91$	52 127.60 Te Tellurium $E_K: 31.8138$ $E_{L-III}: 4.3414$ $\sigma_{na}: 4.7$	53 126.90 I Iodine $E_K: 33.1694$ $E_{L-III}: 4.5571$ $\sigma_{na}: 6.15$	54 131.29 Xe Xenon $E_K: 34.5614$ $E_{L-III}: 4.7822$ $\sigma_{na}: 23.9$		
55 132.91 Cs Cesium $E_K: 35.985$ $E_{L-III}: 5.0119$ $\sigma_{na}: 29.0$	56 137.33 Ba Barium $E_K: 37.441$ $E_{L-III}: 5.2470$ $\sigma_{na}: 1.1$	Lanthanide group La-Lu below	72 178.49 Hf Hafnium $E_K: 65.351$ $E_{L-III}: 9.5607$ $\sigma_{na}: 104.1$	73 180.95 Ta Tantalum $E_K: 67.416$ $E_{L-III}: 9.8811$ $\sigma_{na}: 20.6$	74 183.84 W Tungsten $E_K: 69.525$ $E_{L-III}: 10.2068$ $\sigma_{na}: 18.3$	75 186.21 Re Rhenium $E_K: 71.676$ $E_{L-III}: 10.5353$ $\sigma_{na}: 89.7$	76 190.23 Os Osmium $E_K: 73.871$ $E_{L-III}: 10.8709$ $\sigma_{na}: 16$	77 192.22 Ir Iridium $E_K: 76.111$ $E_{L-III}: 11.2152$ $\sigma_{na}: 425$	78 195.08 Pt Platinum $E_K: 78.395$ $E_{L-III}: 11.5637$ $\sigma_{na}: 10.63$	79 196.97 Au Gold $E_K: 80.725$ $E_{L-III}: 11.9187$ $\sigma_{na}: 98.65$	80 200.59 Hg Mercury $E_K: 83.1023$ $E_{L-III}: 12.2839$ $\sigma_{na}: 372.3$	81 204.38 Tl Thallium $E_K: 85.530$ $E_{L-III}: 12.6575$ $\sigma_{na}: 3.43$	82 207.2 Pb Lead $E_K: 88.005$ $E_{L-III}: 13.0352$ $\sigma_{na}: 0.00048$	83 208.98 Bi Bismuth $E_K: 90.526$ $E_{L-III}: 13.4186$ $\sigma_{na}: 0.0338$	84 209.98 Po Polonium $E_K: 93.105$ $E_{L-III}: 13.8138$ $\sigma_{na}: 3.937$	85 209.99 At Astatine $E_K: 95.730$ $E_{L-III}: 14.2135$ $\sigma_{na}: 0.72$	86 222.02 Rn Radon $E_K: 98.404$ $E_{L-III}: 14.6194$ $\sigma_{na}: 0.72$		
87 223.02 Fr Francium $E_K: 101.137$ $E_{L-III}: 15.0312$ $\sigma_{na}: 0.72$	88 226.03 Ra Radium $E_K: 103.922$ $E_{L-III}: 15.4444$ $\sigma_{na}: 12.8$	Actinide group Ac-Lr below	104 261.11 Rf Rutherfordium $E_K: 112.601$ $E_{L-III}: 16.7331$ $\sigma_{na}: 200.6$	105 262.11 Db Dubnium $E_K: 115.606$ $E_{L-III}: 17.1663$ $\sigma_{na}: 7.57$	106 269.13 Sg Seaborgium $E_K: 118.7$ $E_{L-III}: 17.6$ $\sigma_{na}: 175.9$	107 270.13 Bh Bohrium $E_K: 124.8$ $E_{L-III}: 18.053$ $\sigma_{na}: 1.81$	108 269.13 Hs Hassium $E_K: 127.8$ $E_{L-III}: 19.1$ $\sigma_{na}: 147.8$	109 278.16 Mt Meitnerium $E_K: 127.8$ $E_L: 147.8$	110 281.17 Ds Darmstadtium	111 281.17 Rg Roentgenium	112 285.18 Cn Copernicium	113 286.18 Nh Nihonium	114 289.19 Fl Flerovium	115 288.19 Mc Moscovium	116 293.20 Lv Livermorium	117 293.21 Ts Tennessine	118 294.21 Og Oganesson		

Lanthanides group La - Lu	57 138.91 La Lanthanum $E_K: 38.925$ $E_{L-III}: 5.4827$ $\sigma_{na}: 9.87$	58 140.12 Ce Cerium $E_K: 40.443$ $E_{L-III}: 5.7234$ $\sigma_{na}: 0.63$	59 140.91 Pr Praseodymium $E_K: 41.991$ $E_{L-III}: 5.9643$ $\sigma_{na}: 11.5$	60 144.24 Nd Neodymium $E_K: 43.569$ $E_{L-III}: 6.2079$ $\sigma_{na}: 50.5$	61 146.92 Pm Promethium $E_K: 45.180$ $E_{L-III}: 6.4593$ $\sigma_{na}: 168.4$	62 150.36 Sm Samarium $E_K: 46.834$ $E_{L-III}: 6.7162$ $\sigma_{na}: 5922$	63 151.96 Eu Europium $E_K: 48.520$ $E_{L-III}: 6.9769$ $\sigma_{na}: 4530$	64 157.93 Gd Gadolinium $E_K: 50.239$ $E_{L-III}: 7.2428$ $\sigma_{na}: 49700$	65 158.93 Tb Terbium $E_K: 51.996$ $E_{L-III}: 7.5140$ $\sigma_{na}: 23.4$	66 162.50 Dy Dysprosium $E_K: 53.789$ $E_{L-III}: 7.7901$ $\sigma_{na}: 944$	67 164.93 Ho Holmium $E_K: 55.618$ $E_{L-III}: 8.0711$ $\sigma_{na}: 64.7$	68 167.26 Er Erbium $E_K: 57.486$ $E_{L-III}: 8.3579$ $\sigma_{na}: 159$	69 168.93 Tm Thulium $E_K: 59.390$ $E_{L-III}: 8.6480$ $\sigma_{na}: 100$	70 173.04 Yb Ytterbium $E_K: 61.332$ $E_{L-III}: 8.9436$ $\sigma_{na}: 34.8$	71 174.97 Lu Lutetium $E_K: 63.314$ $E_{L-III}: 9.2441$ $\sigma_{na}: 74$
Actinides group Ac - Lr	89 127.03 Ac Actinium $E_K: 106.755$ $E_{L-III}: 15.8710$ $\sigma_{na}: 902.4$	90 232.04 Th Thorium $E_K: 109.660$ $E_{L-III}: 16.3003$ $\sigma_{na}: 7.37$	91 231.04 Pa Protactinium $E_K: 112.601$ $E_{L-III}: 16.7331$ $\sigma_{na}: 200.6$	92 238.03 U Uranium $E_K: 115.606$ $E_{L-III}: 17.1663$ $\sigma_{na}: 7.57$	93 237.05 Np Neptunium $E_K: 118.7$ $E_{L-III}: 17.6$ $\sigma_{na}: 175.9$	94 244.06 Pu Plutonium $E_K: 124.8$ $E_{L-III}: 18.053$ $\sigma_{na}: 1.81$	95 243.06 Am Americium $E_K: 127.8$ $E_{L-III}: 19.1$ $\sigma_{na}: 147.8$	96 247.07 Cm Curium $E_K: 127.8$ $E_L: 147.8$	97 247.07 Bk Berkelium	98 251.08 Cf Californium	99 252.08 Es Einsteinium	100 257.10 Fm Fermium	101 258.10 Md Mendelevium	102 259.10 No Nobelium	103 262.11 Lr Lawrencium

Data according to IUPAC 2016, NIST, university Washington, IAEO, KAERI
*: radioactive element, mostly stable isotope

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