

THE PERIODIC TABLE OF THE ELEMENTS

WITH NOMENCLATURE KEYS

monatomic ions

| | |
|----|----|
| +1 | +2 |
|----|----|

1
IA
IA

| | |
|------------------------------------|-----------------|
| 1 H hydrogen 1.008 | 2 IIA IIA |
|------------------------------------|-----------------|

Physical State: gas, liquid, solid, man-made
Key to writing and naming oxy-anions and oxy-acids

| | | |
|--|---------------------|--|
| | New notation | |
| | Previous IUPAC form | |
| | CAS version | |

monatomic ions

| | | | | |
|----|------|----|----|----|
| +3 | +/-4 | -3 | -2 | -1 |
|----|------|----|----|----|

18

VIIIA

| | |
|-----------------------------------|--|
| 2 He helium 4.003 | |
|-----------------------------------|--|

| | | | | |
|--------------------|------------------|----------------|------------------|--------------------|
| 13 IIIB IIIA | 14 IVB IVA | 15 VB VA | 16 VIB VIA | 17 VIIB VIIA |
|--------------------|------------------|----------------|------------------|--------------------|

Use Roman Numeral for +chg.

Exceptions: acetate (ethanoate) $C_2H_3O_2^{1-}$ or CH_3COO^{1-} ; cyanide CN^{1-} ; ammonium NH_4^{1+} ; hydronium H_3O^{1+} ; mercury(I) Hg_2^{2+} ; oxalate $C_2O_4^{2-}$; hydroxide OH^{1-} ; nitrate NO_3^{1-} ; permanganate MnO_4^{1-} ; peroxide O_2^{2-} ; chromate CrO_4^{2-} ; dichromate $Cr_2O_7^{2-}$; thiocyanate SCN^{1-} ; thiosulfate $S_2O_3^{2-}$

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|--------------------------------------|---------------------------------------|---------------------------------------|--|--------------------------------------|--|---------------------------------------|---------------------------------------|---|---|--|---|--------------------------------------|---------------------------------------|--|---|---|--|----------------------------------|
| 3 Li lithium 6.941 | 4 Be beryllium 9.012 | | | | | | | | | | | | 5 B boron 10.81 | 6 C carbon 12.01 | 7 N ₂ nitrogen 14.01 | 8 O ₂ oxygen 16.00 | 9 F ₂ fluorine 19.00 | 10 Ne neon 20.18 |
| 11 Na sodium 22.99 | 12 Mg magnesium 24.30 | 3 IIIA IIIB | 4 IVA IVB | 5 VA VB | 6 VIA VIB | 7 VIIA VIIB | 8 VIII VIII | 9 VIIIA VIII | 10 IIIB IIB | 11 IB IB | 12 IIB IIB | 13 Al aluminum 26.98 | 14 Si silicon 28.09 | 15 P ₄ phosphorus 30.97 | 16 S ₈ sulfur 32.07 | 17 Cl ₂ chlorine 35.45 | 18 Ar argon 39.95 | |
| 19 K potassium 39.10 | 20 Ca calcium 40.08 | 21 Sc scandium 44.96 | 22 Ti titanium 47.87 | 23 V vanadium 50.94 | 24 Cr chromium 52.00 | 25 Mn manganese 54.94 | 26 Fe iron 55.85 | 27 Co cobalt 58.93 | 28 Ni nickel 58.69 | 29 Cu copper 63.55 | 30 Zn ⁺² zinc 65.39 | 31 Ga gallium 69.72 | 32 Ge germanium 72.61 | 33 As arsenic 74.92 | 34 Se selenium 78.96 | 35 Br ₂ bromine 79.90 | 36 Kr krypton 83.80 | |
| 37 Rb rubidium 85.47 | 38 Sr strontium 87.62 | 39 Y yttrium 88.91 | 40 Zr zirconium 91.22 | 41 Nb niobium 92.91 | 42 Mo molybdenum 95.94 | 43 Tc technetium (98) | 44 Ru ruthenium 101.1 | 45 Rh rhodium 102.9 | 46 Pd palladium 106.4 | 47 Ag ⁺¹ silver 107.9 | 48 Cd ⁺² cadmium 112.4 | 49 In indium 114.8 | 50 Sn tin 118.7 | 51 Sb antimony 121.8 | 52 Te tellurium 127.6 | 53 I ₂ iodine 126.9 | 54 Xe xenon 131.3 | |
| 55 Cs cesium 132.9 | 56 Ba barium 137.3 | 57 La lanthanum 138.9 | 72 Hf hafnium 178.5 | 73 Ta tantalum 180.9 | 74 W (wolfram) tungsten 183.8 | 75 Re rhenium 186.2 | 76 Os osmium 190.2 | 77 Ir iridium 192.2 | 78 Pt platinum 195.1 | 79 Au gold 197.0 | 80 Hg mercury 200.6 | 81 Tl thallium 204.4 | 82 Pb lead 207.2 | 83 Bi bismuth 209.0 | 84 Po polonium (209) | 85 At astatine (210) | 86 Rn radon (222) | |
| 87 Fr francium (223) | 88 Ra radium (226) | 89 Ac actinium (227) | 104 Rf rutherfordium (261) | 105 Db dubnium (262) | 106 Sg seaborgium (263) | 107 Bh bohrium (262) | 108 Hs hassium (265) | 109 Mt meitnerium (266) | 110 Ds darmstadtium (271) | 111 Rg roentgenium (272) | 112 Cp copernicium (277) | 113 Uut 3 | 114 Uuq 3 | 115 Uup 4 | 116 Uuh 4 | 117 Uus 3 | 118 Uuo #of O's in -ate ion (-ic acid) neg chg in ion or H's in acid | |

| | | |
|--------------------------------------|-----------|---------------|
| The -ate ion leads to the -ic acid. | | |
| The -ite ion leads to the -ous acid. | | |
| per_ate | +1 O | per_ic acid |
| -ate | O's chart | -ic acid |
| -ite | -1 O | -ous acid |
| hypo_ite | -2 O's | hypo_ous acid |
| hydro__ic acids are binary - no O's | | |

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|-------------------------------------|--|---------------------------------------|--|---------------------------------------|---------------------------------------|--|---------------------------------------|---|---|--------------------------------------|--|---------------------------------------|---|
| 58 Ce cerium 140.1 | 59 Pr praseodymium 140.9 | 60 Nd neodymium 144.2 | 61 Pm promethium (145) | 62 Sm samarium 150.4 | 63 Eu europium 152.0 | 64 Gd gadolinium 157.2 | 65 Tb terbium 158.9 | 66 Dy dysprosium 162.5 | 67 Ho holmium 164.9 | 68 Er erbium 167.3 | 69 Tm thulium 168.9 | 70 Yb ytterbium 173.0 | 71 Lu lutetium 175.0 |
| 90 Th thorium 232.0 | 91 Pa protactinium 231.0 | 92 U uranium 238.0 | 93 Np neptunium (237) | 94 Pu plutonium (244) | 95 Am americium (243) | 96 Cm curium (247) | 97 Bk berkelium (247) | 98 Cf californium (251) | 99 Es einsteinium (252) | 100 Fm fermium (257) | 101 Md mendelevium (258) | 102 No nobelium (259) | 103 Lr lawrencium (260) |

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|--------------------------|---------|
| Greek Numerical Prefixes | |
| 1 mono | 6 hexa |
| 2 di | 7 hepta |
| 3 tri | 8 octa |
| 4 tetra | 9 nona |
| 5 penta | 10 deca |