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Noble Gases
18IIIA

1 1 H 1766 1.01 1 2.1 Water -253 Hydrogen	2 2 He 1895 4.00 2 0 Gas in balloons -272 Helium	3 3 Li 1817 6.94 2.1 0.98 Watch battery 180 1347 Lithium	4 4 Be 1797 9.01 2.2 1.57 Emerald 1278 2970 Beryllium	5 5 Na 1807 22.99 2.8,1 0.93 Table salt 98 883 Sodium	6 6 Mg 1755 24.31 2.8,2 1.31 Car wheels 639 1090 Magnesium	7 7 B 1808 10.81 2.3 2.04 Oven proof glass 2300 2550 Boron	8 8 C BC 12.01 2.4 2.55 Graphite pencils 3500 3827 Carbon	9 9 N 1772 14.01 2.5 3.44 Fertiliser -210 -196 Nitrogen	10 10 O 1774 16.00 2.6 3.98 Breathing apparatus -218 -183 Oxygen	11 11 F 1886 19.00 2.7 3.98 Toothpaste -220 -188 Fluorine	12 12 Ne 1898 20.18 2.8 0 Signs -249 -246 Neon	13 13 Al 1825 26.98 2.8,3 1.61 Cans 660 2467 Aluminium	14 14 Si 1824 28.09 2.8,4 1.9 Glass/silicon chips 1410 2355 Silicon	15 15 P 1669 30.97 2.8,5 2.19 Matches 44 280 Phosphorus	16 16 S BC 32.07 2.8,6 2.58 Vulcanised rubber 113 445 Sulfur	17 17 Cl 1774 35.45 2.8,7 3.16 Pool chemicals -101 -35 Chlorine	18 18 Ar 1894 39.95 2.8,8 0 Light globe -189 -186 Argon	19 19 K 1807 39.10 2.8,8,1 0.82 Fertiliser 64 774 Potassium	20 20 Ca 1808 40.08 2.8,8,2 1.00 Teeth 839 1484 Calcium	21 21 Sc 1879 44.96 2.8,9,2 1.36 Aquamarine 1539 2832 Scandium	22 22 Ti 1791 47.87 2.8,10,2 1.54 Artificial joint 1660 3287 Titanium	23 23 V 1830 50.94 2.8,11,2 1.63 Springs/tools 1890 3380 Vanadium	24 24 Cr 1797 52.00 2.8,13,1 1.66 Car parts 1857 2672 Chromium	25 25 Mn 1774 54.94 2.8,13,2 1.55 Rock crushers 1245 1962 Manganese	26 26 Fe BC 55.85 2.8,15,2 1.83 Bridges 1535 2750 Iron	27 27 Co 1735 58.93 2.8,15,2 1.88 Magnets 1495 2870 Cobalt	28 28 Ni 1751 58.69 2.8,16,2 1.91 Coins 1453 2732 Nickel	29 29 Cu BC 63.55 2.8,18,1 1.9 Electrical wires 1083 2567 Copper	30 30 Zn BC 65.39 2.8,18,2 1.65 Brass instruments 420 907 Zinc	31 31 Ga 1875 69.72 2.8,18,3 1.81 Medical diagnostics 30 2403 Gallium	32 32 Ge 1886 72.64 2.8,18,4 2.01 Fibre optics 937 2830 Germanium	33 33 As BC 74.92 2.8,18,5 2.18 Treated pine 81 613 Arsenic	34 34 Se 1817 78.96 2.8,18,6 2.55 Anti dandruff shampoo 217 685 Selenium	35 35 Br 1826 79.90 2.8,18,7 2.96 Photographic film -7 59 Bromine	36 36 Kr 1898 83.80 2.8,18,8 0 Signs -157 -183 Krypton	37 37 Rb 1861 85.47 2.8,18,8,1 0.82 Purple fireworks 39 688 Rubidium	38 38 Sr 1790 87.62 2.8,18,8,2 0.95 Red fireworks 769 1384 Strontium	39 39 Y 1794 88.91 2.8,18,9,2 1.22 Colour TV 1523 3337 Yttrium	40 40 Zr 1789 91.22 2.8,18,10,2 1.33 Zircon gems 1852 4377 Zirconium	41 41 Nb 1801 92.91 2.8,18,12,1 1.60 Rocket nozzle 2468 4927 Niobium	42 42 Mo 1781 95.94 2.8,18,13,1 2.16 Cutting tools 2617 4612 Molybdenum	43 43 Tc 1937 98.00 2.8,18,13,2 1.9 Medical diagnostics 2200 4877 Technetium	44 44 Ru 1844 101.07 2.8,18,15,1 2.2 Fountain pen nibs 2250 3900 Ruthenium	45 45 Rh 1803 102.91 2.8,18,16,1 2.28 Search light reflectors 1966 3727 Rhodium	46 46 Pd 1803 106.42 2.8,18,18 2.2 Catalytic converter 1552 2927 Palladium	47 47 Ag BC 107.87 2.8,18,18,1 1.93 Jewellery 962 2212 Silver	48 48 Cd 1817 112.41 2.8,18,18,2 1.69 Batteries 321 765 Cadmium	49 49 In 1863 114.82 2.8,18,18,3 2.00 MP3 players 157 1780 Indium	50 50 Sn BC 118.71 2.8,18,18,4 1.96 Bronze 232 2270 Tin	51 51 Sb BC 121.76 2.8,18,18,5 2.05 Cosmetics 630 1750 Antimony	52 52 Te 1782 127.6 2.8,18,18,6 2.1 Solar cells 449 990 Tellurium	53 53 I 1811 126.9 2.8,18,18,7 2.66 Antiseptic 114 184 Iodine	54 54 Xe 1898 131.29 2.8,18,18,8 2.6 Overhead projector -112 -108 Xenon	55 55 Cs 1860 132.91 2.8,18,18,8,1 0.79 Atomic clocks 29 678 Caesium	56 56 Ba 1808 137.33 2.8,18,18,8,2 0.89 Medical diagnosis 725 1140 Barium	57 57 La 1839 138.91 1.1 Studio lights 920 3469 Lanthanum	58 58 Ce 1803 140.12 2.8,18,19,9,2 1.12 Cigarette lighter 795 3257 Cerium	59 59 Pr 1885 140.91 2.8,18,21,8,2 1.13 Turbines 935 3127 Praseodymium	60 60 Nd 1885 144.24 2.8,18,22,8,2 1.14 Microphones 1010 3127 Neodymium	61 61 Pm 1945 145.00 2.8,18,22,8,2 1.13 Telescopes 1100 3000 Promethium	62 62 Sm 1879 150.36 2.8,18,22,8,2 1.17 Headphone magnets 1072 1900 Samarium	63 63 Eu 1901 151.96 2.8,18,25,8,2 1.2 Fluorescent globe 822 1597 Europium	64 64 Gd 1880 157.25 2.8,18,25,8,2 1.2 Contrast MRI 1311 3233 Gadolinium	65 65 Tb 1843 158.93 2.8,18,27,8,2 1.1 Compact fluorescent globe 1360 3041 Terbium	66 66 Dy 1886 162.50 2.8,18,28,8,2 1.22 Lasers 1412 2562 Dysprosium	67 67 Ho 1867 164.93 2.8,18,28,8,2 1.23 Magnets 1470 2720 Holmium	68 68 Er 1843 167.26 2.8,18,30,8,2 1.24 Photographic filter 1522 2511 Erbium	69 69 Tm 1879 168.93 2.8,18,32,18,2 1.25 Teeth xrays 1545 1727 Thulium	70 70 Yb 1878 173.04 2.8,18,32,18,2 1.1 Fibre laser 824 1466 Ytterbium	71 71 Lu 1907 174.97 2.8,18,32,18,2 1.27 Catalyst (petroleum) 1656 3315 Lutetium	72 72 Hf 1923 178.49 2.8,18,32,12,2 1.3 Nuclear reactor control rods 2150 5400 Hafnium	73 73 Ta 1802 180.95 2.8,18,32,12,2 1.5 Capacitors 2996 5425 Tantalum	74 74 W 1783 183.84 2.8,18,32,12,2 2.36 Light globe filament 3410 5660 Tungsten	75 75 Re 1925 186.21 2.8,18,32,12,2 1.9 Jet engines 3180 5627 Rhenium	76 76 Os 1803 190.23 2.8,18,32,14,2 2.2 Detect fingerprints 3045 5027 Osmium	77 77 Ir 1803 192.22 2.8,18,32,15,2 2.2 Spark plugs 2410 4527 Iridium	78 78 Pt 1735 195.08 2.8,18,32,17,1 2.28 Jewellery 1772 3827 Platinum	79 79 Au BC 196.97 2.8,18,32,18,1 2.54 Jewellery 1064 2807 Gold	80 80 Hg BC 200.59 2.8,18,32,18,2 2.00 Thermometer -39 357 Mercury	81 81 Tl 1861 204.38 2.8,18,32,18,3 2.04 Portable xray machine 303 1457 Thallium	82 82 Pb BC 207.20 2.8,18,32,18,4 2.33 Car battery 327 1740 Lead	83 83 Bi BC 208.98 2.8,18,32,18,5 2.02 Antacid 271 1560 Bismuth	84 84 Po 1898 209.0 2.8,18,32,18,6 2.00 Power in satellites 254 962 Polonium	85 85 At 1940 210.00 2.8,18,32,18,7 2.2 Radiotherapy 302 337 Astatine	86 86 Rn 1900 222.0 2.8,18,32,18,8 0 Predicts earthquakes -71 -62 Radon	87 87 Fr 1939 223.0 2.8,18,32,18,8,1 0.7 Magneto-optical trap Stony Brook NY 27 677 Francium	88 88 Ra 1898 226.00 2.8,18,32,18,8,2 0.89 Luminous paints 700 1737 Radium	89 89 Ac 1899 227.00 2.8,18,32,18,9,2 1.1 Mineral (Monks-Cat) © Enrica Bonaccini 1050 3200 Actinium	90 90 Th 1829 231.04 2.8,18,32,18,9,2 1.3 Camera lenses 1750 4790 Thorium	91 91 Pa 1913 231.04 2.8,18,32,18,9,2 1.3 Protactinium © European Union 2010 1568 - Protactinium	92 92 U 1789 238.03 2.8,18,32,19,2 1.38 Yellow cake 1132 3818 Uranium	93 93 Np 1940 237 2.8,18,32,19,2 1.36 Pure Neptunium LANL 640 3902 Neptunium	94 94 Pu 1940 244 2.8,18,32,19,2 1.28 Artificial heart pacemaker © Oak Ridge Assoc., Univ 640 3235 Plutonium	95 95 Am 1944 243 2.8,18,32,19,2 1.3 Smoke detector 994 2607 Americium	96 96 Cm 1944 247 2.8,18,32,19,2 1.3 Elemental analysis of soil on Mars 1340 - Curium	97 97 Bk 1949 247 2.8,18,32,19,2 1.3 7 mg of pure Bk-249 986 - Berkelium	98 98 Cf 1950 251 2.8,18,32,19,2 1.3 10 mg of pure Cf-249 900 - Californium	99 99 Es 1952 252 2.8,18,32,19,2 1.3 Solution of self-ionising Es-253 860 - Einsteinium	100 100 Fm 1952 257 2.8,18,32,19,2 1.3 Fermium-Neptunium alloy 1527 - Fermium	101 101 Md 1955 258 2.8,18,32,19,2 1.3 Instrument used to study Mo-98 1521 - Mendelevium	102 102 No 1958 259 2.8,18,32,19,2 1.3 Penning Ion Trap, GSI 827 - Nobelium	103 103 Lr 1961 262 2.8,18,32,19,3 - Radioactive 1627 - Lawrencium
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Atomic number
Radioactive
Element symbol
Year of discovery
Atomic weight
Electron configuration
Electronegativity
Melting point (°C)
Boiling point (°C)
Example use
Name (temporary name)
Element type

92 Solid*
92 Liquid*
92 Gas*
92 Unknown

*Standard lab conditions:
25°C, 101.325 kPa

Transition metals
Post-transition metals
Alkali metals
Alkaline earth metals
Lanthanides
Actinides
Semimetals
Noble gases
Non metals