

THE PERIODIC TABLE OF ELEMENTS

H
Hydrogen 1
E rocket fuel
E hydrogenation of oils to make fats
E vehicle fuel
E ammonia
A: 1.01

Li
Lithium 3
E rocket fuel additive
E pacemaker battery
M aircraft material
C lubricant additive, glass
C antidepressant
A: 6.94

Na
Sodium 11
E coolant in nuclear reactors
M street light
C kitchen salt, soda, glass
C airbag
C cosmetics, soap
A: 23.00

K
Potassium 19
C synthetic fertilizer
C glasses, lenses
C matches, gunpowder
C salt (sodium chloride) substitute
A: 39.10

Rb
Rubidium 37
E photoelectric cell
E gas scavenger (in vacuum tube)
E fuel cell
C hardened glass
C blood circulation regulator
A: 85.47

Cs
Caesium 55
E photoelectric cell
E gamma radiation source
E atomic clock
E infra-red lamp
E rocket fuel additive
A: 132.91

Fr
Francium 87
Seldom found in nature
A: (223)

Be
Beryllium 4
E x-ray tube window
M aircraft brakes
M golf clubs
M (watch) spring
M spark-free tools
A: 9.01

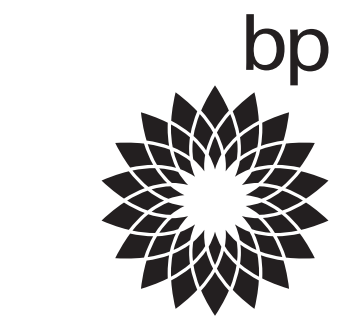
Mg
Magnesium 12
E flare
M car wheel, aircraft
C firebrick
C powder for gymnasts
C pigment, filler
A: 24.31

Ca
Calcium 20
E metallurgy
M cable insulation, battery
C synthetic fertilizer, salt
C treatment for icy roads
C plaster, cement
C filler in paper, paint
A: 40.01

Sr
Strontium 38
C nuclear battery in buoys & weather stations
C permanent magnet
C phosphorescent paint
C fireworks
C toothpaste for sensitive teeth
A: 87.62

Ba
Barium 56
M gas scavenger (in vacuum tube)
C lubricant additive
C filler, pigment for paper
C fireworks, X-ray photo of digestive system
C mud used in oil drilling
A: 137.33

Ra
Radium 88
A: 226.03



Sc
Scandium 21
E leak detector
C seed germinating agent
C lights for sets for TV productions
A: 44.96

Ti
Titanium 22
E heat exchanger
M aircraft
M bone pin, prosthesis
C pigment for paint and paper
C polymerization catalyst
A: 47.88

V
Vanadium 23
M construction material
M tools, spring
M jet engines
C antifouling paint
C catalyst for sulfuric acid production
A: 50.94

Cr
Chromium 24
E plating, protecting
M steel for tools and knives
C catalyst for methanol production
C camouflage paint, laser
C cassette and video-tapes
A: 52.00

Mn
Manganese 25
M steel for railway points
M tools, axles
M safe
C battery
C glass, black pigment
A: 54.94

Fe
Iron 26
E magnet
M bridge, car, boat, machine
M 'tin' can
M tools, nail
C glass, black pigment
A: 55.85

Co
Cobalt 27
E gamma radiation source
M razor blades
M permanent magnet
C pigment
A: 58.93

Ni
Nickel 28
E coins
E catalyst for hydrogenation
M cutlery
M 'white gold', crucible
C nickel plating
C rechargeable battery
A: 58.69

Cu
Copper 29
E wire, cable, printing
M bridge, sculpture
M brass
M coin, tube, tap
M pipe, ship propeller
M bell
A: 63.55

Zn
Zinc 30
E corrosion resistant coating (galvanising)
E battery, gutter
M car parts, brass
C cosmetics
C white pigment in rubber
A: 65.39

Ga
Gallium 31
E quartz thermometer
E light emitting diode (LED)
C TV screen
C transistor, tumour locator
C infra-red detector
A: 69.72

Ge
Germanium 32
E infra-red optics
E reflector in projector
E transistor, diode
M solar cells
A: 72.61

As
Arsenic 33
E laser printer
C wood protection
C glass
C light emitting diode (LED)
C infra-red detector
A: 74.92

Se
Selenium 34
E light meter
E photocopier
C infra-red optics
C colouring glass
C anti-dandruff shampoo
A: 78.96

Br
Bromine 35
C tear gas
C flame retardant
C pharmaceuticals
C photographic paper, film
A: 79.90

Kr
Krypton 36
E fluorescent tube
E arc lamp, flash bulb
E gas for leak tester
E wavelength standard
C UV laser
A: 83.80

Y
Yttrium 39
M jet engine
C colour TV screens
C camera lenses
C firebricks
C laser, radar (filter)
A: 88.91

Zr
Zirconium 40
E nuclear fuel rods
M percussion cap
C flame retardant
C furnace bricks
C oxygen meter
A: 91.22

Nb
Niobium 41
M cutting tools
M pipelines
M superconducting magnet
C welding rod
M orthopaedic implants
A: 92.91

Mo
Molybdenum 42
E filament in electric heater
M rocket motor, turbine
C flame retardant
M catalytic converter
C catalyst in petrochemistry
A: 95.94

Tc
Technetium 43
E radiation source for medical research
A: (98)

Ru
Ruthenium 44
M car spark plug
M electrical contact
M resistance wire
C lubricant
M jewellery
A: 101.07

Rh
Rhodium 45
E mirror in projector
M telephone relay
M jewellery
M catalytic converter
M aircraft spark plug
A: 102.91

Pd
Palladium 46
E catalytic converter
E hydrogen absorption and storage
M dental crowns
M watches, jewellery
A: 106.42

Ag
Silver 47
E mirror, battery
M coins, jewellery
M silverware
C photographic paper, film
C photosensitive glass
A: 107.87

Cd
Cadmium 48
E rechargeable battery
M control rods in nuclear reactor
C light meter
C pigment in enamel, ceramic and oil paint
A: 112.41

In
Indium 49
E solar cell
M car bearings
M motor in grand prix car
C glass coating
A: 114.82

Sn
Tin 50
M tin can, solder, coin
M bronze
M organ pipe
C anti-fouling paint
C opalescent glass, enamel
A: 118.71

Sb
Antimony 51
M solder
M lead battery, bearings
M shotgun pellets
C fire retardant
C infra-red detector
A: 121.75

Te
Tellurium 52
E percussion cap
M steel for work on lathes
M resistance wire
C vulcanization of rubber
A: 127.60

I
Iodine 53
E disinfectant
E treatment of thyroid cancer
E halogen lamp
C X-ray diagnosis
C salt additive, prevention of goitre
A: 126.90

Xe
Xenon 54
E UV lamp, sun lamp
E car lamp, flash bulb
E lamp for projector
E electronic indicator
E UV laser
A: 131.29

La
Lanthanum 57
M lighter flint
M battery electrode
C catalytic converter
C camera lenses
A: 138.91

Hf
Hafnium 72
E nuclear submarine
E control rods in nuclear reactor
E gas scavenger for vacuum tube
M jet engine
M tools
A: 178.49

Ta
Tantalum 73
E electrical condenser
M vacuum tube filaments
M cutting tool, rocket
M spectacle frames, prosthesis
C camera lenses
A: 180.95

W
Tungsten 74
E welding electrode
M lamp filament, tv
M armour, shell, bullet
M rocket nozzle
M cutting and boring tools
M jewellery
A: 183.85

Re
Rhenium 75
E oven filament
M catalytic 4-car petrol production
M fountain pen nib
M jewellery plating
M clock bearing
M thermocouple
A: 186.21

Os
Osmium 76
E catalyst for ammonia production
M fountain pen nib
M compass needle
M clock bearing
M jewellery
A: 190.2

Ir
Iridium 77
E cancer irradiation
M hypodermic needle
M helicopter spark plug
C fountain pen nib
A: 192.22

Pt
Platinum 78
E catalyst for nitric acid production
M crucible
M melting pot for glass, jewellery
M dental crown
C anti-tumour agent
A: 195.08

Au
Gold 79
E precious metal
E jewellery
E electrical contact
M dental crown
C rheumatism treatment
A: 196.97

Hg
Mercury 80
E thermometer
E street light
E sun lamp, energy-saving bulb
M dental filling
A: 200.59

Tl
Thallium 81
M thermometer filling
E low-melting glass
C infra-red detector
C infra-red camera lenses
A: 204.38

Pb
Lead 82
E radiation protection
M roof covering, battery
M solder, ammunition
C red lead paint
C crystal glass
A: 207.2

Bi
Bismuth 83
M fusewire
M sprinkler, shotgun pellet
C glass, ceramic
C burns dressing
C cosmetics
A: 208.98

Po
Polonium 84
E nuclear battery
E neutron source
A: (209)

At
Astatine 85
Seldom found in nature
A: (210)

Rn
Radon 86
E earthquake predictor
A: (222)

Ac
Actinium 89
A: 227.03

Rutherfordium 104
Dubnium 105
Seaborgium 106
Bohrium 107
Hassium 108
Meitnerium 109

Ce: Cerium 58
M lighter flint
M polishing powder for TV glass
C arc lamp
A: 140.12

Pr: Praseodymium 59
M lighter flint
M permanent magnet
C searchlight
C glass for welding spectacles
A: 140.91

Nd: Neodymium 60
M permanent magnet
C colouring for spectacles
C ceramic condenser
C glass for laser and lenses
A: 144.24

Pm: Promethium 61
C nuclear battery
C thickness meter
A: (145)

Sm: Samarium 62
M permanent magnet
M neutron scavenger
C maser
C ceramic condenser
A: 150.36

Eu: Europium 63
M neutron scavenger
M optical memory
C x-ray screen
A: 151.96

Gd: Gadolinium 64
M chromium steel
M permanent magnet
M video recorder
C x-ray tube
C computer memory
A: 157.25

Tb: Terbium 65
C x-ray screen
C fluorescent lamp
C laser
A: 158.93

Dy: Dysprosium 66
M aircraft metal
M permanent magnet
C laser, bulbs
A: 162.50

Ho: Holmium 67
C laser
C glass colouring
A: 164.93

Er: Erbium 68
E infra-red absorbing glass
M vanadium steel
C glass colouring
C laser
A: 167.26

Tm: Thulium 69
E x-ray equipment
C pigment for TV screen
C microwave
A: 168.93

Yb: Ytterbium 70
M stainless steel
C transistor, diode
A: 173.04

No: Nobelium 102
A: (259)

Lr: Lawrencium 103
A: (260)

KEY

At room temperature the element is:

- Yellow** gas
- Red** liquid
- White** solid
- Green** man-made solid

Appearance in nature:

- Unshaded** only as compounds
- Shaded** free element
- Half-shaded** as the element and in compounds

Used as:

Calcium 20

E name, atomic number
M element (text in black)
C alloy, blend or mixture (text in red)
A: compound (text in dark blue)
A: relative atomic mass (to 2 d.p.)

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He
Helium 2
E inflating balloons, airships
E leak detector, laser
E welding blanket gas
E nuclear reactor coolant
M in atmosphere for deep diving
A: 4.00

Ne
Neon 10
E neon light
E fog light, tv tube
E barcode reader
E voltage probe
E laser
A: 20.12

Ar
Argon 18
E light bulb filling
E gas discharge tube
E geiger counter, laser
E welding blanket gas
E gas chromatography
A: 39.95

Kr
Krypton 36
E fluorescent tube
E arc lamp, flash bulb
E gas for leak tester
E wavelength standard
C UV laser
A: 83.80

Xe
Xenon 54
E UV lamp, sun lamp
E car lamp, flash bulb
E lamp for projector
E electronic indicator
E UV laser
A: 131.29

Rn
Radon 86
E earthquake predictor
A: (222)

THE ASSOCIATION OF THE BRITISH PHARMACEUTICAL INDUSTRY

The Association of the British Pharmaceutical Industry (ABPI) represents companies in Britain that research, develop, manufacture and market prescription medicines. Britain is a world leader in pharmaceuticals, five of the world's top 25 best selling medicines were developed in the UK and over 80% of the medicines and vaccines supplied to the National Health Service are produced by ABPI member companies.

The pharmaceutical industry is constantly developing new, safer and more effective treatments for many diseases which affect people all over the world.

The Association and its member companies actively support the study of science in schools, colleges and universities by providing information on real life applications of science and technology.

BP

BP is one of the world's largest petroleum and petrochemical groups. BP's main activities are the exploration and production of crude oil and natural gas; refining, marketing, supply and transportation; and manufacturing and marketing of petrochemicals. The company is a global leader in the manufacture and use of solar photovoltaic products.

BP has well-established operations in Europe, North and South America, Australasia and Africa.

BP believes education is the key to the future – not only for business, but for society as a whole. As such, BP continues to support the partnership of business and education working together.

CHEMICAL INDUSTRY EDUCATION CENTRE

In 1988, the Chemical Industry Education Centre, CIEC, was established as a joint venture between the University of York and the Chemical Industries Association (CIA), the UK trade association for the chemical industry. It aims to enhance understanding of the chemical industry principally by providing exciting balanced science teaching and learning resources and parallel programmes of professional development for teachers and industrialists.

The CIA was born in 1965, by bringing together a trade association and an employers' federation.

Large and small chemical companies from all parts of the United Kingdom pay membership fees to CIA, whose purpose it is to support the UK chemical industry in maintaining its successful operation and development.

The University of York has an excellent international and national reputation for science education in terms of research work and curriculum developments, typified by the Salters' GCSE Science Course and the Advanced Chemistry Course.

ROYAL SOCIETY OF CHEMISTRY

The Royal Society of Chemistry is the UK Professional Body for chemical scientists and an international Learned Society for the chemical sciences with 46,000 members world-wide. It is a major international publisher of chemical information, supports the teaching of the chemical sciences at all levels and is a leader in bringing science to the public.

The RSC's object, as stated in its Royal Charter, is 'the general advancement of chemical science and its application'. Arising from this, the RSC makes a

significant effort to help teachers and students, at all levels of education, by its various activities.

There are six divisions of the RSC catering for specialist interests. The Education Division has around 4,000 members which enables chemistry teachers to be continually involved with curriculum developments and abreast of the latest teaching methods and learning aids.

There are also 35 Local Sections of the RSC which cater for the local needs of members and organise schools' lectures, careers talks and local competitions.

THE PERIODIC TABLE OF ELEMENTS

THE ASSOCIATION OF THE BRITISH PHARMACEUTICAL INDUSTRY

CHEMICAL INDUSTRY EDUCATION CENTRE

ROYAL SOCIETY OF CHEMISTRY

THE ASSOCIATION OF THE BRITISH PHARMACEUTICAL INDUSTRY

The Association of the British Pharmaceutical Industry (ABPI) provides paper and web based resources for teachers and students to enhance study of science, business studies and manufacturing in schools and colleges. The ABPI also provides information on careers in the pharmaceutical industry and routes into these areas of work.

Career information: www.abpi-careers.org.uk
Life enhancing careers – a career in the pharmaceutical industry.

Curriculum resources:

Interactive web resources sponsored by ABPI are available on www.schoolscience.co.uk
Information on other materials sponsored by ABPI may be obtained from:

Publications Department
ABPI, 12 Whitehall, London SW1A 2DY
Tel: 020 7930 3477
Fax: 020 7747 1411
Web: www.abpi.org.uk

BP

BP has been working with teachers for over 35 years to develop and produce educational materials about BP and its industry for schools and colleges.

The materials support the following curriculum areas:

- Science
- Citizenship
- Business studies
- Design and technology
- Geography

For further information or to order any BPES resources contact:

BP Educational Service (BPES)
PO Box 635, Harrow, Middlesex HA1 2GU
BPES Helpline: 0870 333 0428
Fax: 0870 333 0131
Email: bpes@bp.com
Web: www.bp.com/bpes

CHEMICAL INDUSTRY EDUCATION CENTRE

The Centre:

- offers a specialist research and consultancy service to industry and schools.
- designs, publishes and distributes teaching and learning resources which illustrate industrial applications of science and technology defined by the various UK curricula and which include stimulating, interactive activities.
- contributes to public understanding of science, for example, by working with science museums and hands-on centres and by arranging interactive displays at science festivals.
- trains science and technology teachers and industrialists to use the CIEC publications and to work together effectively.

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ROYAL SOCIETY OF CHEMISTRY

Activities for teachers include:

- Industry Study Tours
- Symposia on the latest chemical techniques
- Summer Schools
- Management Workshops

Activities for students include:

- Chemistry at Work exhibitions
- Summer Schools
- International Chemistry Olympiad competition
- Top of the Bench competition

Available resources include:

- Careers posters, broadsheets and booklets
- Schools and Colleges Publications Service
- Curriculum materials

For further details of the ways in which the Royal Society of Chemistry can help support teaching chemistry in schools and colleges, please contact:

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