

THE PERIODIC TABLE OF ELEMENTS

KEY



rocket fuel additive pacemaker battery aircraft material lubricant additive, glass

matches, gunpowde

VACUÜM

gas scavenger (in vacuum tube) fuel cell hardened glass blood circulation regulator 85.47

photoelectric cell gamma radiation source atomic clock infra-red lamp

Fr

Seldom found in nature

rocket fuel additive

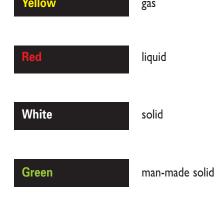
coolant in nuclear reactor

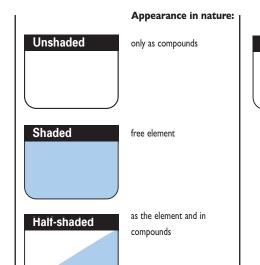


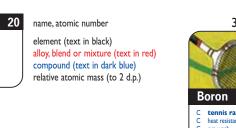






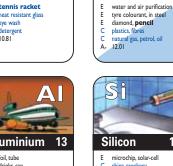






Used as:

© Association of the Dutch Chemical Industry (VNCI)



Ga 🍿

light emitting diode (LED) TV screen

transistor, tumour locato infra-red detector Ar 69.72

Thallium

permanent magnet
laser, bulbs
Ar 162.50

Gallium



infra-red optics reflector in projector transistor, diode solar cells 72.61

S

tin can, solder, coir

Lead

Carbon





cryogenic surgery freezing food ammonia production synthetic fertilizer explosive 14.01

toothpaste
food acidity regulat



Bismuth

cosmetics r 208.98

C glass colouring C laser A_r 167.26



Te Te

steel for work on la

ellurium

combustion steel production

respiration water purification 16.00

Sulfur

battery, sulfuric acid produc vulcanization of ubber preservative hair care (perm lotion)



water additive

non-stick coating aluminium producti 19.00

water disinfection

hydrochloric acid plastic (PVC) bleaching agent A_r 35.45



E inflating balloons,
airships
E leak detector, laser
E welding blanket gas
nuclear reactor coolant
M in atmosphere for deep div
A_r 4.00

E neon light
E fog light, tv tube
E barcode reader
E voltage probe
E laser
Ar 20.12

E light bulb filling
E gas discharge tube
E geiger counter, laser
E welding blanket gas
E gas chromatography
A_r 39.95













Lu: Lutetium 71

lodine

halogen lamp
X-ray diagnosis
salt additive, pn
of goitre
126.90

At

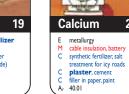
Polonium Astatine 85

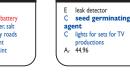




Barium 56

gas scavenger (in vacuum tub ilubricant additive filler, pigment for paper fireworks, X-ray photo c digestive system mud used in oil drilling Ar 137.33









Lanthanum 57

lighter flint
battery electrode
catalytic converter
C camera lenses
Ar 138.91





Hafnium 72

gas scavenger for vacuum

M tools Ar 178.49

Titanium

aircraft **bone pin**, prosthesis

pigment for paint and pape polymerization catalyst 47.88

Medicines for a

Healthy Future



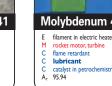
camera lenses 180.95

arc lamp r 140.12

Ce: Cerium 58

/anadium 23

antifouling paint catalyst for sulfuric



Fungsten

1 cutting and boring tools Ar 183.85

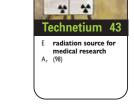
searchlight ceramic colouring glass for welding spectacles 140.91

Chromium 24

plating, protecting

catalyst for methanol

production camouflage paint, laser cassette and video-tapes 52.00



Rhenium

oven filament catalyst 4-star petrol production

jewellery plating anode X-ray tube

glass for laser and lenses 144.24

M thermocouple Ar 186.21



production

fountain pen nib

compass needle

clock bearing

C nuclear battery
C thickness meter
A_r (145)

magnet bridge, car, boat, mach

M tools, nail Ar 55.85



Sm: Samarium 62

ceramic condenser 150.36

Rhodium

razor blades



Pd

Palladium 46

Nickel 28

coins catalyst for hydrogenation

nickel plating rechargeable battery 58.69



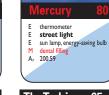
Copper

Ag

Silver



C x-ray tube C computer memory A_r 157.25



corrosion resistant coating (galvanising) battery, gutter car parts, brass cosmetics

Cadmium 48

rechargeable batter

light meter pigment in enamel, ceramic and oil paint









Tm: Thulium 69

coating on filament wire 'breeder' reactor fuel nuclear battery for space nuclear reactor fuel C nuclear reactor fuel Ar (244)

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 of 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.

hromium Manganese Iron Cobalt Nickel Copper Zinc Gallium Germaniun rsenic Selenium Bromine Krypton Rubidium Strontium Yttriun alladium Silver Cadmium Indium Tin Antimony Tellurium Iodine Xenor aesium Barium Lanth num Cerium Praseodymium Neodymium lolmium Erbium Thulium Ytte ungsten Rhenium Osmium Iridium Platinum Gold Mercury Thallium Lead ismuth Polonium Astatine Radon Francium Radium Actinium Thoriun rotactinium Uranium Neptunium Americium Curium Berkeliun leon Sodium Magnesium Aluminium Silicon Phosphorus Sulfu Argon Potassium Calcium Scandium Titanium Vanadiur romethium Samarium Europium Gadolinium Terbium Dysprosiun alifornium Einsteinium Fermium Mendelevium Nobelium Lawrenciun lydrogen Helium Lithium Beryllium Boron Carbon Nitrogen Oxyge hlorine Argon Potassium Calcium Scandium Titanium Vanadiun hromium Manganese Iron Cobalt Nickel Copper Zinc Gallium Germaniun rsenic Selenium Bromine Krypton Rubidium Strontium Yttrium irconium Niobium Molybdenum Technetium Ruthenium Rhodiun alladium Silver Cadmium Indium Tin Antimony Tellurium Iodine Xeno:

hlorine Argon Potassium Calcium Scandium Titanium Vanadiun

THE ASSOCIATION OF THE BRITISH PHARMACEUTICAL INDUSTRY

Johnium Erbium Thulium Ytterbium Lutetium Hafnium Tantalum ungsten Rhenium Osmium Iridium BPatinum Gold Mercury Thallium Leadismuth Polonium Astatine Radon Francium Radium Actinium Thorium Protactinium Uranium Neptunium Americium Curium Berkelium alifornium Einstellium Lawrencium Edifornium Einstellium Fermium Mendelevium Hassium Meitnerium lydrogen Helium Literoyal Society of Chemistry bon Nitrogen Oxyger Iuorine Neon Sodium Magnesium Aluminium Silicon Phosphorus Sulfur Chlorine Argon Potassium Calcium Scandium Titanium Vanadium Chromium Manganese Iron Cobalt Nickel Copper Zinc Gallium Germanium Arsenic Selenium Bromine Krypton Rubidium Strontium Yttrium Circonium Niobium Molybdenum Technetium Ruthenium Rhodium Palladium Silver Cadmium Indium Tin Antimony Tellurium Iodine Xenoraesium Barium Lanthanum Cerium Praseodymium Neodymium

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 technologyGeography

For further information or to order any BPES resources contact:

BP Educational Service (BPES)

PO Box 635, Harrow, Middlesex HAI 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.

Chemical Industry Education Centre
Department of Chemistry
University of York
Heslington
York YO10 5DD
Tel: 01904 432523
Fax: 01904 434460
Email: ciec@york.ac.uk
Web: www.ciec.org.uk

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

Updated 2005

- 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:

The Education Department
Royal Society of Chemistry
Burlington House
Piccadilly
London WIJ 0BA
Tel: 020 7440 3344
Fax: 020 7287 9825

Email: education@rsc.org
Web: www.rsc.org or www.chemsoc.org/learnnet

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