

H

HYDROGEN

THE LIGHTEST ELEMENT

MASS

1.008

ELECTRONS

 $1s^1$

BOILS

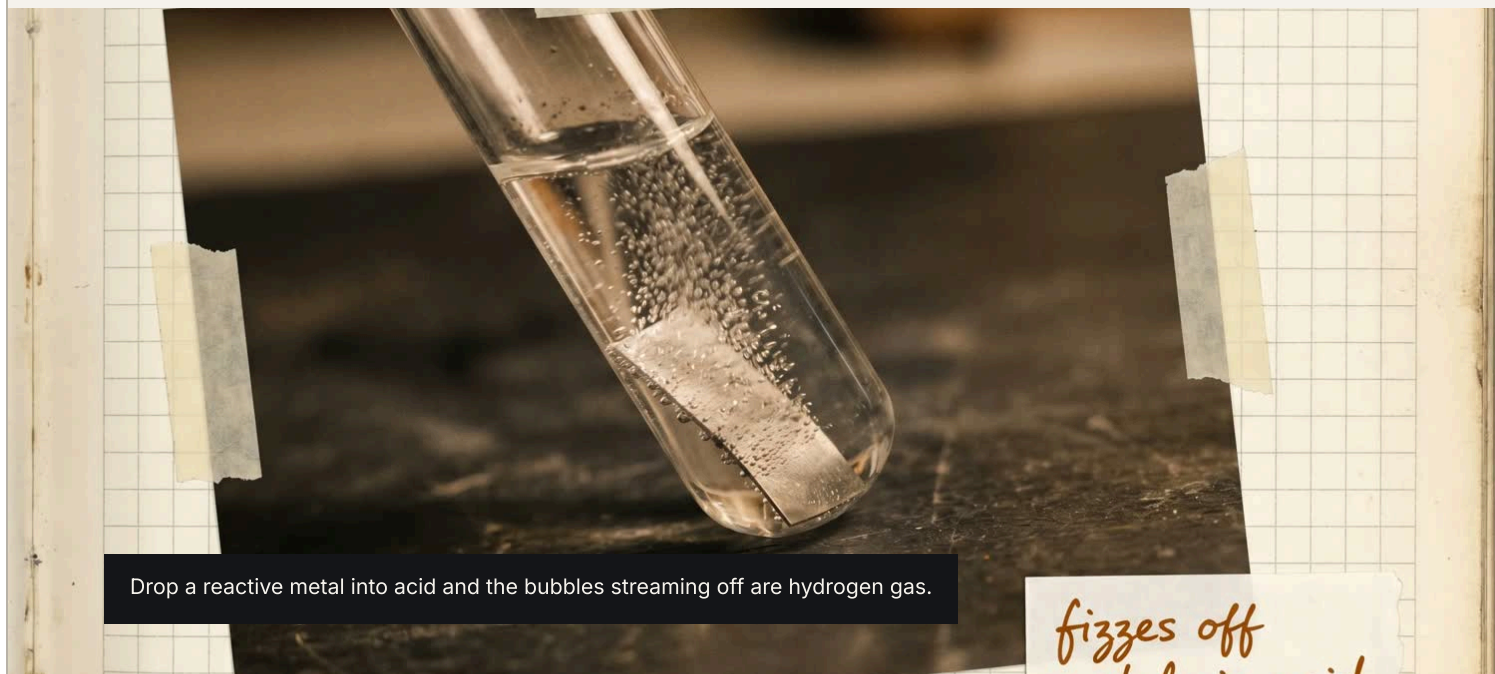
 $-253\text{ }^\circ\text{C}$

CHARGE

 $-1, +1$ 

DANGER

2/5 Caution



Drop a reactive metal into acid and the bubbles streaming off are hydrogen gas.

fizzes off



He

HELIUM

SECOND-MOST-ABUNDANT ELEMENT IN THE UNIVERSE

MASS
4.0026

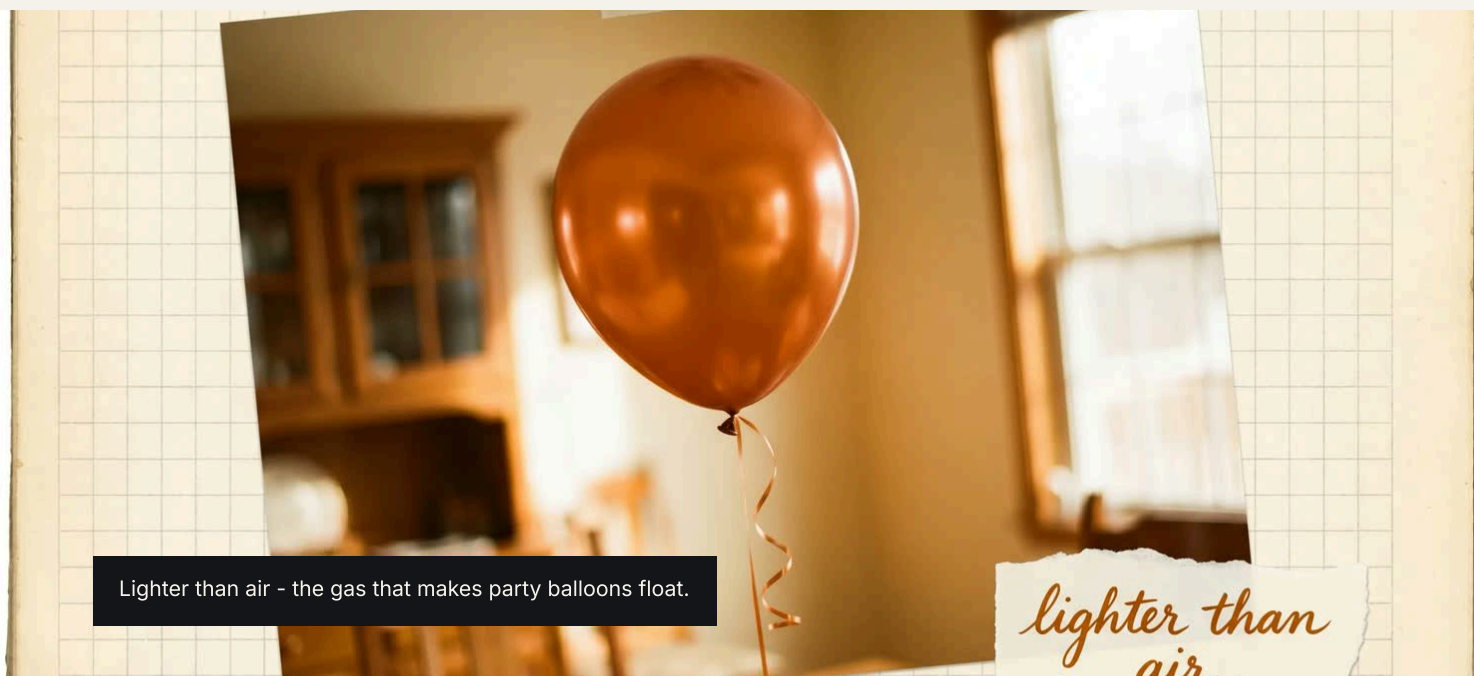
ELECTRONS
 $1s^2$

BOILS
-269 °C

CHARGE
0



DANGER
2/5 Caution



Lighter than air - the gas that makes party balloons float.

*lighter than
air*



Li

LITHIUM

LIGHTEST METAL

MASS

6.94

ELECTRONS

[He] 2s¹

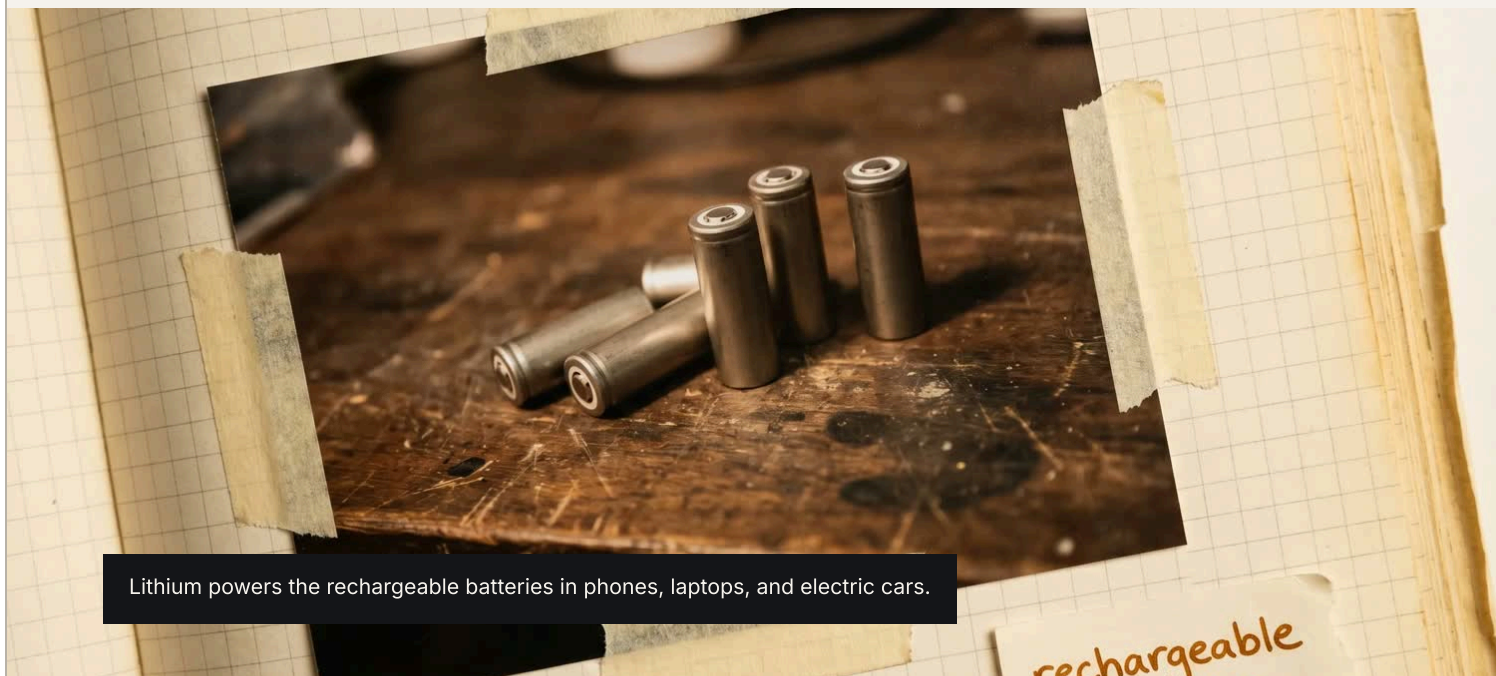
BOILS

1330 °C

CHARGE

+1

DANGER

3/5 Hazardous

Lithium powers the rechargeable batteries in phones, laptops, and electric cars.



Be

BERYLLIUM

USED IN ALLOYS FOR SPACECRAFT AND IN THE WINDOWS OF X-RAY TUBES

MASS

9.0122

ELECTRONS

[He] 2s²

BOILS

2469 °C

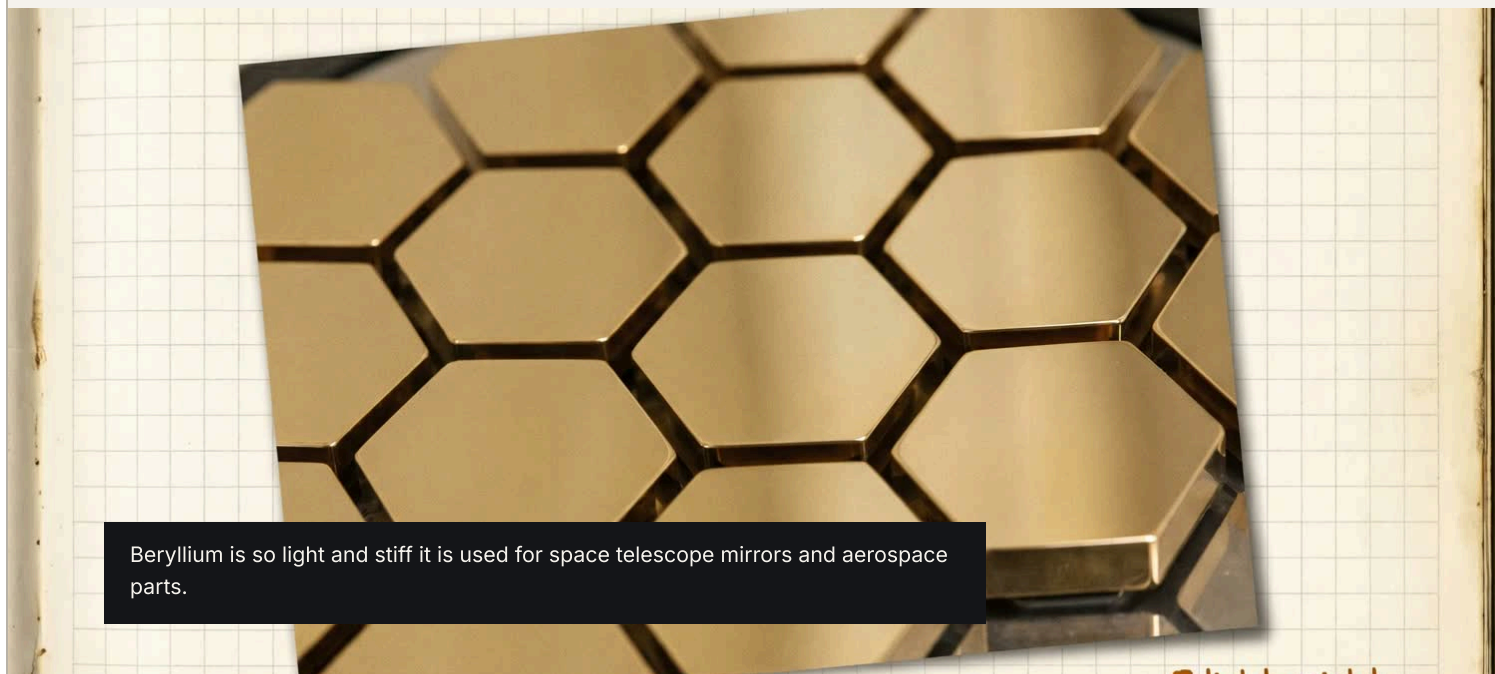
CHARGE

+2



DANGER

4/5 Severe



Beryllium is so light and stiff it is used for space telescope mirrors and aerospace parts.



B

BORON

IN EVERY BOROSILICATE GLASS BEAKER (PYREX)

MASS

10.81

ELECTRONS

 $[\text{He}] 2s^2 2p^1$

BOILS

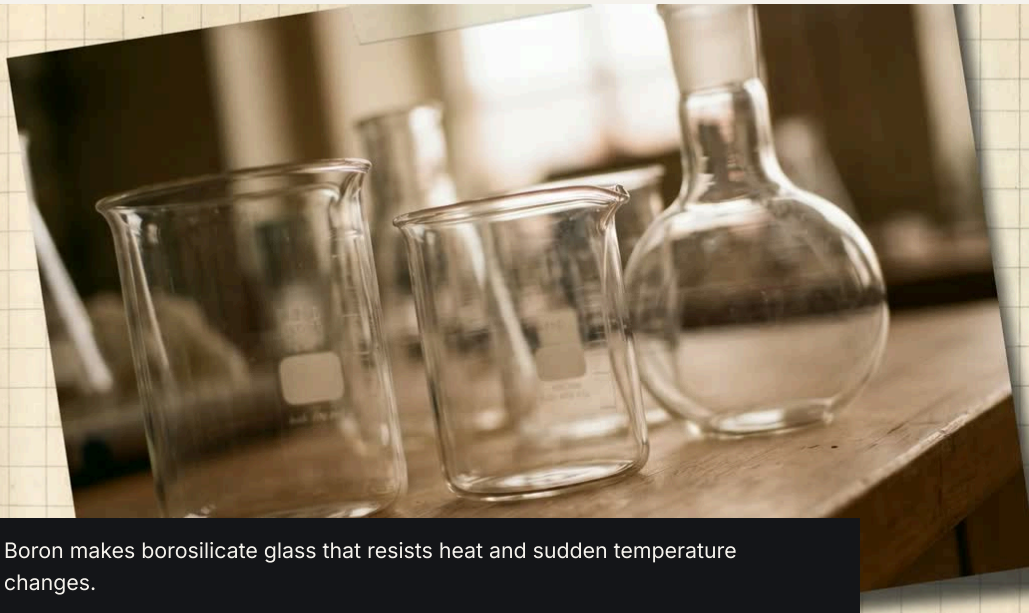
3927 °C

CHARGE

+3

DANGER

0/5 Safe to handle



Boron makes borosilicate glass that resists heat and sudden temperature changes.



C

CARBON

THE BACKBONE OF EVERY ORGANIC MOLECULE

MASS

12.011

ELECTRONS

 $[\text{He}] 2s^2 2p^2$

BOILS

3825 °C

CHARGE

-4, +2, +4



DANGER

1/5 Low risk



A pencil's "lead" is really graphite - pure carbon sliding off in thin layers.

pencil "lead"



N

NITROGEN

78% OF THE AIR YOU ARE BREATHING RIGHT NOW IS N₂

MASS
14.007

ELECTRONS
[He] 2s² 2p³

BOILS
-196 °C

CHARGE
-3, +3, +5



DANGER
1/5 Low risk



Liquid nitrogen is so cold it instantly freezes whatever it touches, like a balloon.



0

OXYGEN

21% OF THE AIR

MASS
15.999ELECTRONS
[He] 2s² 2p⁴BOILS
-183 °CCHARGE
-2, -1DANGER
2/5 Caution

Oxygen feeds fire: a glowing splint bursts back into flame in an oxygen-rich jar.

reignites a



F

FLUORINE

THE MOST ELECTRONEGATIVE ELEMENT

MASS
18.998

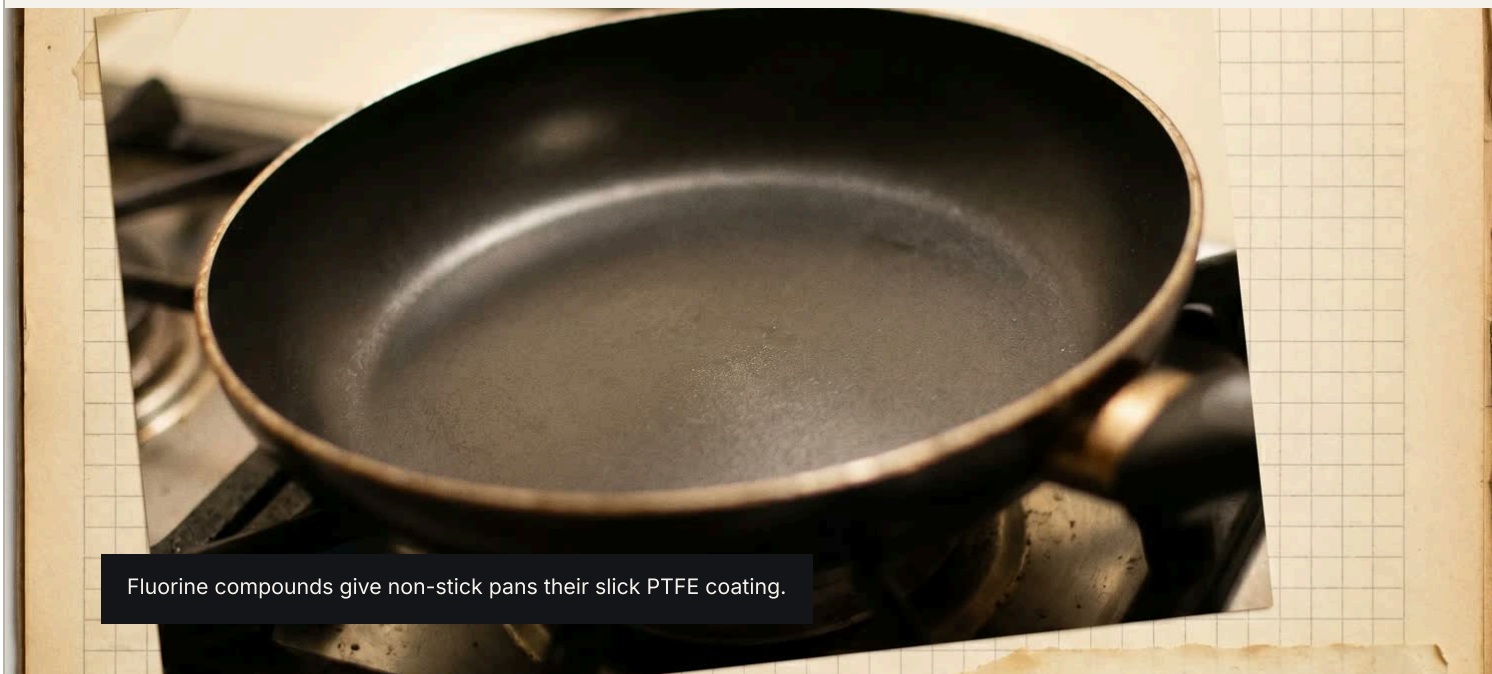
ELECTRONS
[He] 2s² 2p⁵

BOILS
-188 °C

CHARGE
-1



ANGER
5/5 Extreme



Fluorine compounds give non-stick pans their slick PTFE coating.



Ne

NEON

INERT

MASS

20.18

ELECTRONS

 $[\text{He}] 2s^2 2p^6$

BOILS

 $-246\text{ }^\circ\text{C}$

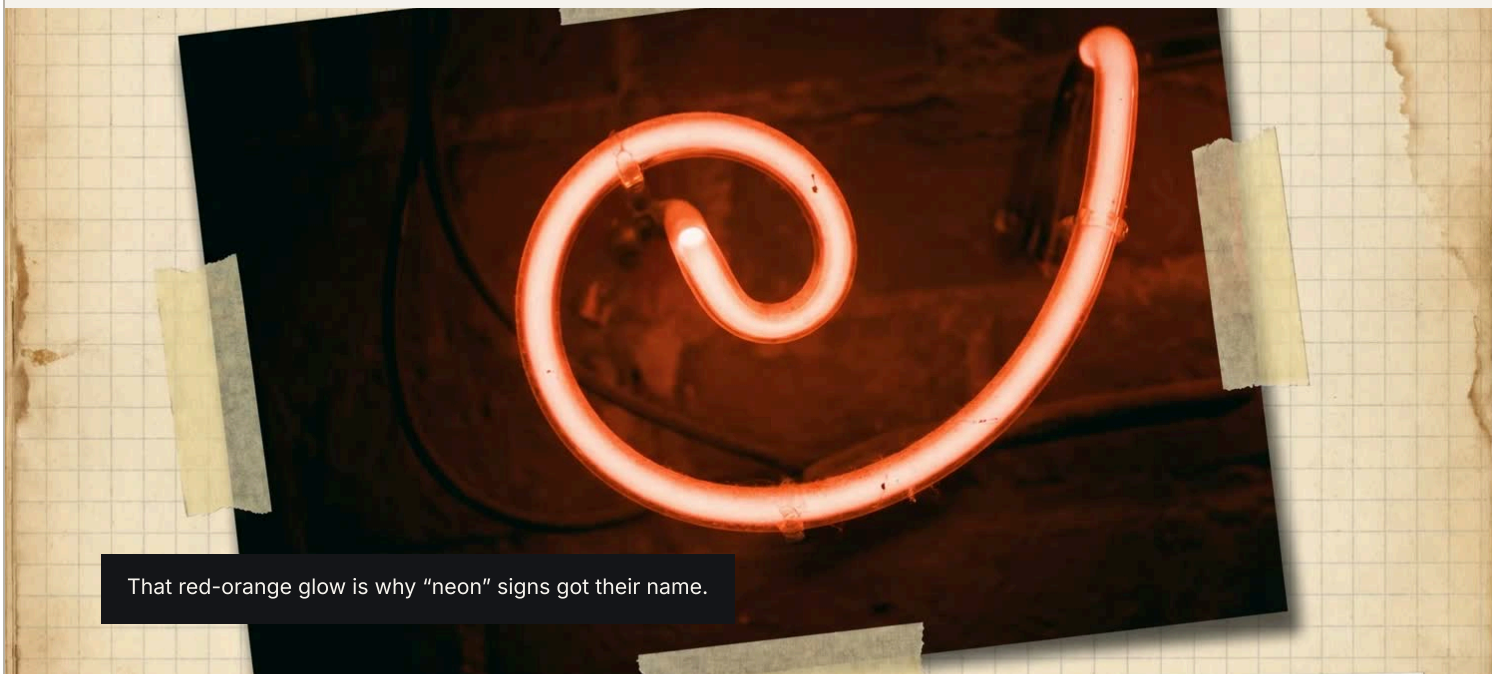
CHARGE

0



DANGER

1/5 Low risk



That red-orange glow is why "neon" signs got their name.



Na

SODIUM

SOFT, SILVER, AND EXPLOSIVE IN WATER

MASS

22.99

ELECTRONS

 $[\text{Ne}] 3s^1$

BOILS

883 °C

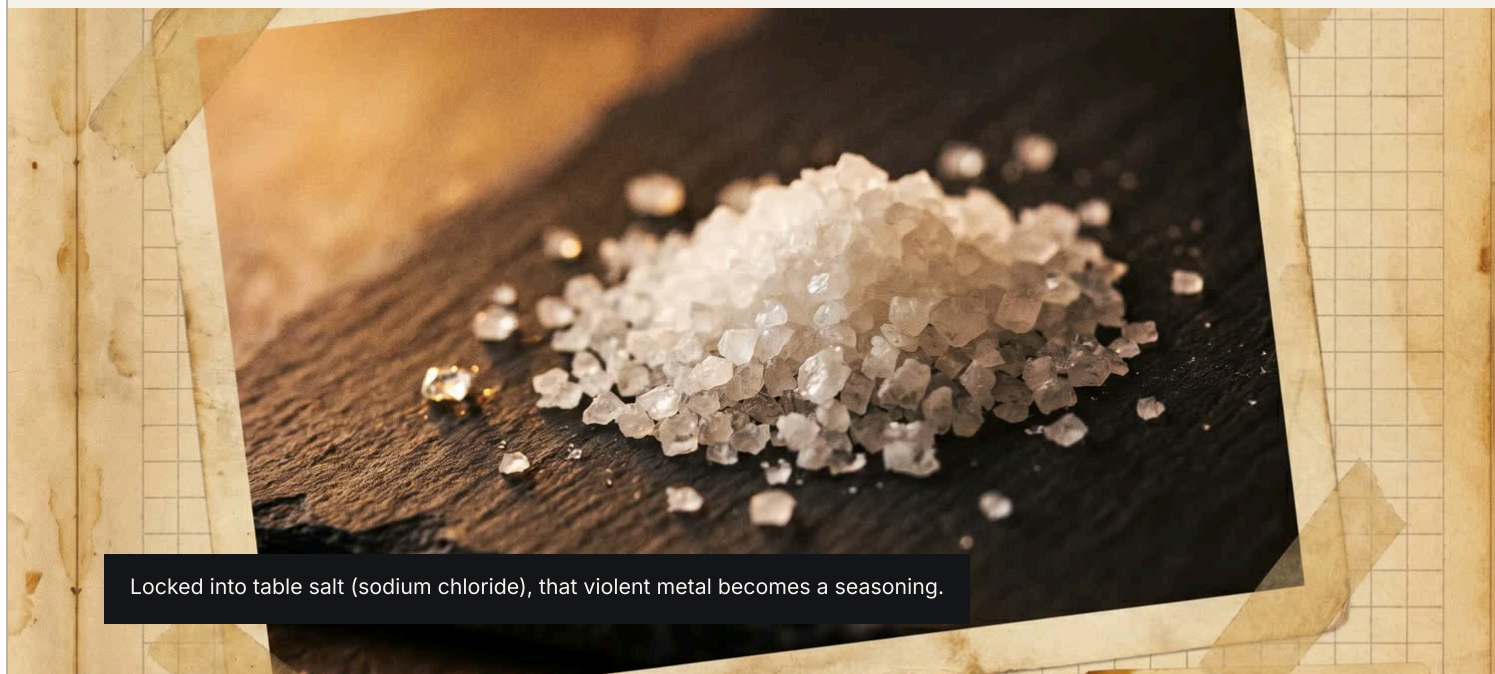
CHARGE

+1



DANGER

3/5 Hazardous



Locked into table salt (sodium chloride), that violent metal becomes a seasoning.



Mg

MAGNESIUM

BURNS WITH A BRILLIANT WHITE FLAME - OLD CAMERA FLASHES AND MODERN FLARES

MASS
24.305

ELECTRONS
[Ne] 3s²

BOILS
1090 °C

CHARGE
+2



DANGER
3/5 Hazardous



Set it alight and magnesium burns with a blinding white flame - old camera flashes used it.



Al

ALUMINUM

THE MOST ABUNDANT METAL IN EARTH'S CRUST

MASS

26.982

ELECTRONS

 $[\text{Ne}] 3s^2 3p^1$

BOILS

2519 °C

CHARGE

+3



DANGER

1/5 Low risk



Drink cans and foil are nearly pure aluminum.



Si

SILICON

THE ELEMENT OF GLASS, SAND, SEMICONDUCTORS, AND SILICON VALLEY

MASS
28.085

ELECTRONS
[Ne] 3s² 3p²

BOILS
3265 °C

CHARGE
-4, +4



DANGER
1/5 Low risk



Sliced into wafers and etched, silicon becomes every computer chip.

*computer
chips*



P

PHOSPHORUS

IN EVERY STRAND OF YOUR DNA, IN EVERY MATCH HEAD, AND IN THE MATRIX OF BONE

MASS
30.974

ELECTRONS
 $[\text{Ne}] 3s^2 3p^3$

BOILS
281 °C

CHARGE
-3, +3, +5



DANGER
4/5 Severe



Red phosphorus coats the striking strip on a matchbox.

red phosphorus



S

SULFUR

YELLOW WHEN PURE

MASS

32.06

ELECTRONS

[Ne] 3s² 3p⁴

BOILS

445 °C

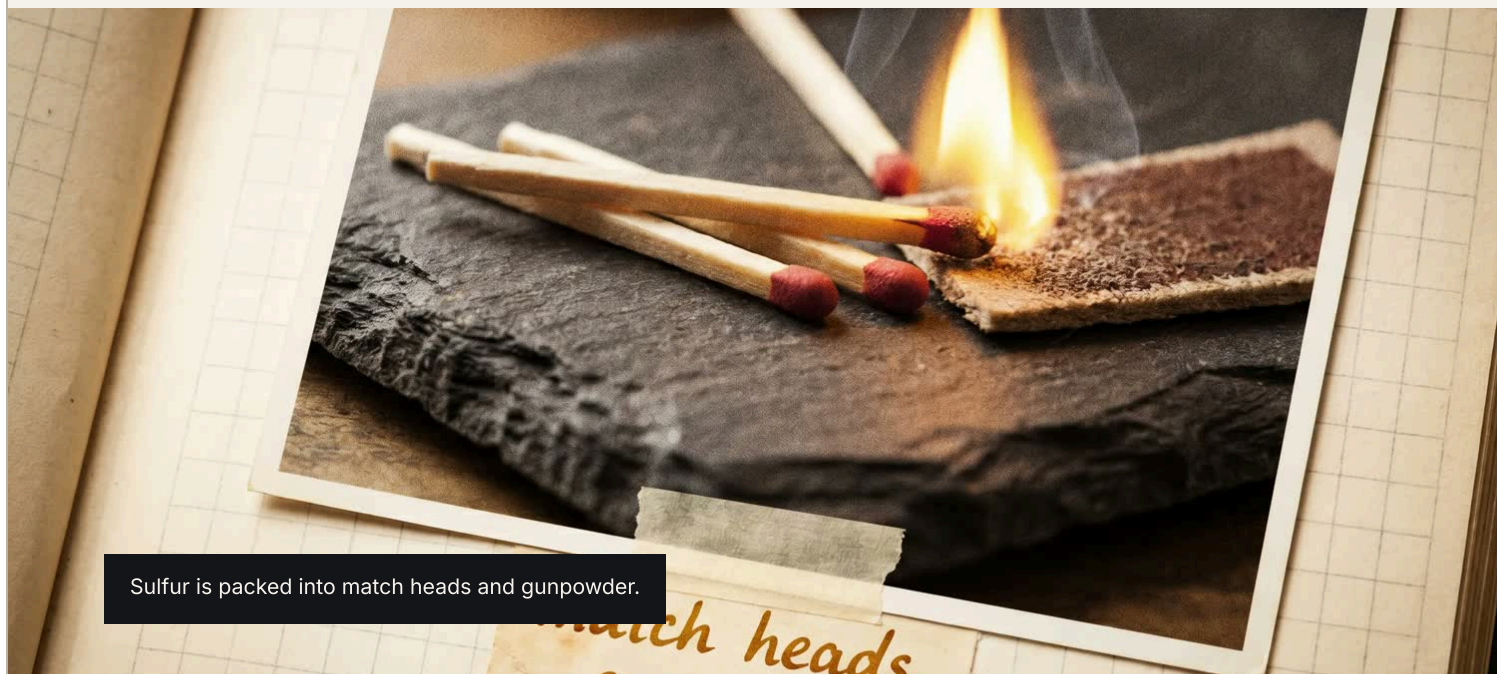
CHARGE

-2, +4, +6



DANGER

2/5 Caution



Sulfur is packed into match heads and gunpowder.



Cl

CHLORINE

YELLOW-GREEN GAS

MASS

35.45

ELECTRONS

 $[\text{Ne}] 3s^2 3p^5$

BOILS

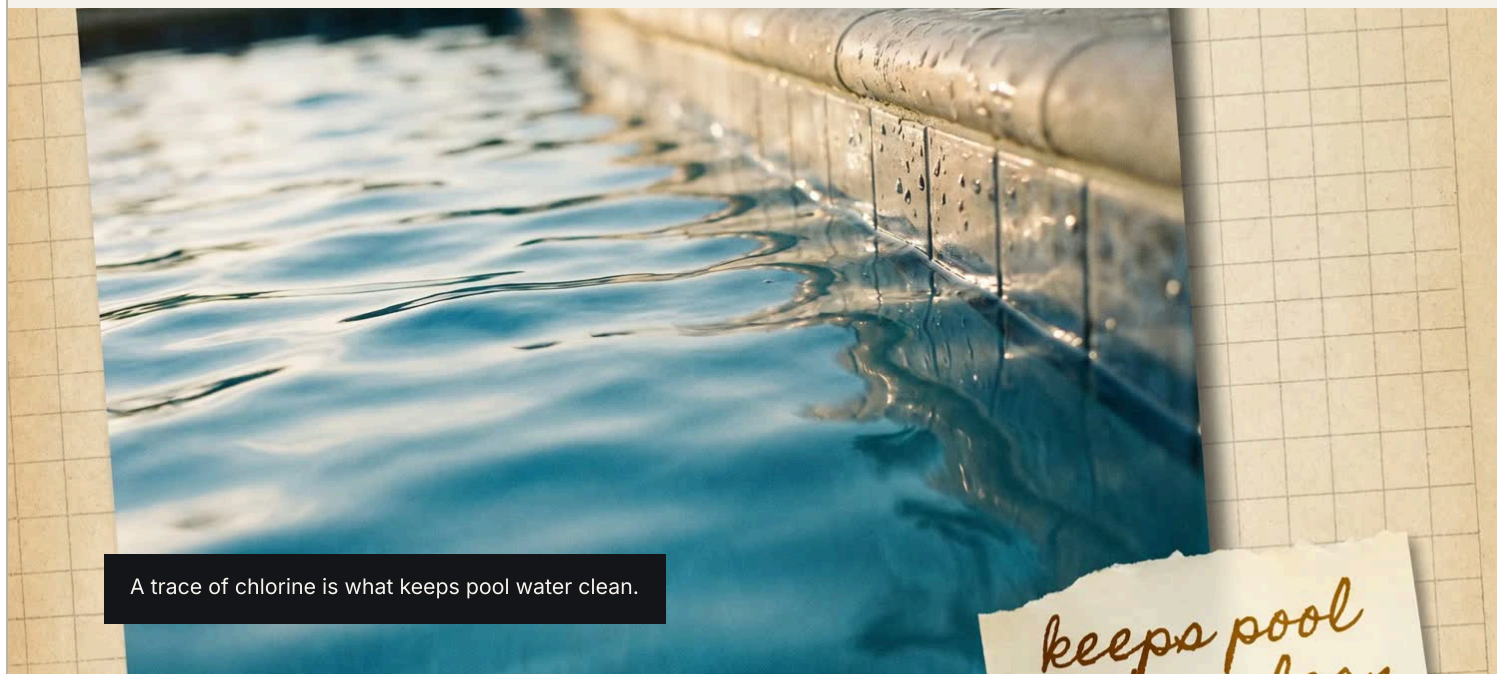
 $-34\text{ }^\circ\text{C}$

CHARGE

 $-1, +1, +3, +5, +7$ 

DANGER

4/5 Severe



A trace of chlorine is what keeps pool water clean.

keeps pool
clean



Ar

ARGON

INERT NOBLE GAS

MASS

39.95

ELECTRONS

 $[\text{Ne}] 3s^2 3p^6$

BOILS

 $-186\text{ }^\circ\text{C}$

CHARGE

0



DANGER

1/5 Low risk



Argon fills light bulbs as an inert gas so the hot filament does not burn up.

inert fill gas



K

POTASSIUM

MORE VIOLENT IN WATER THAN SODIUM - BURSTS INTO PURPLE FLAME

MASS
39.098

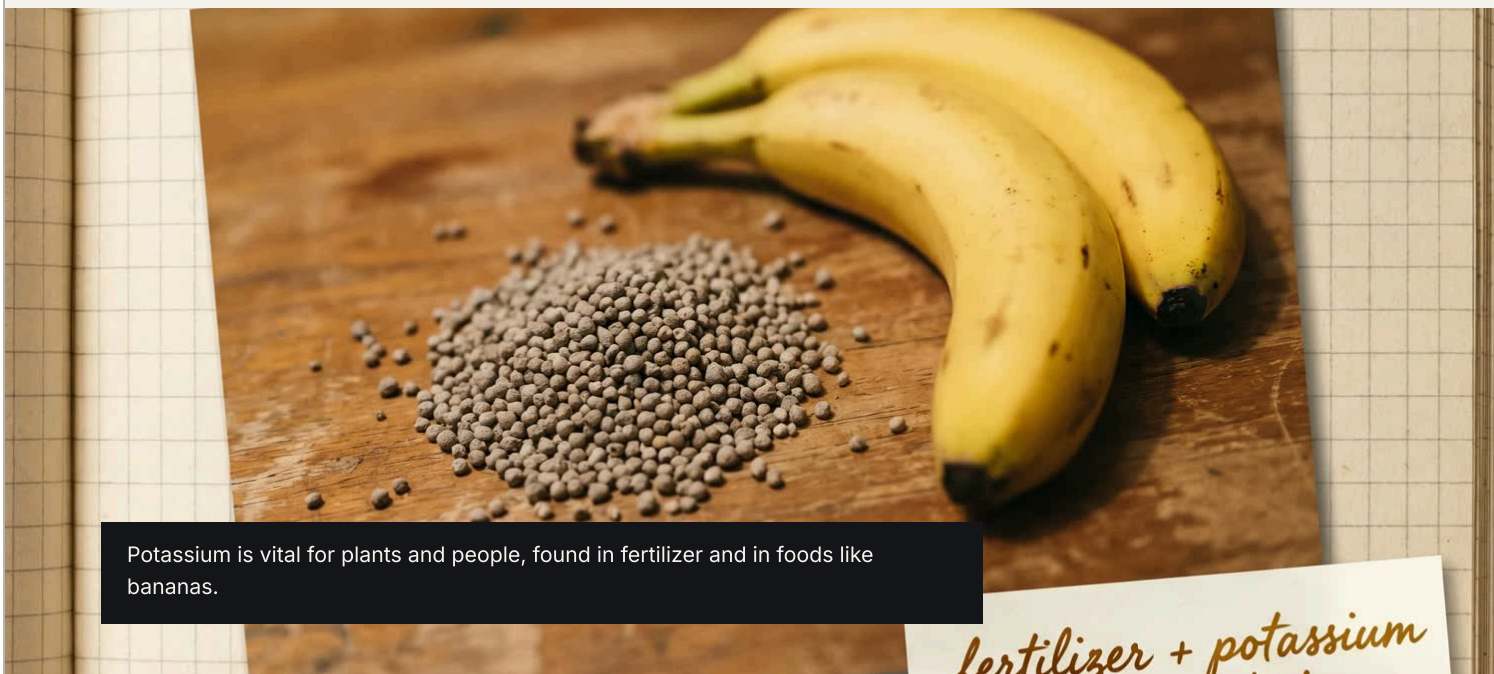
ELECTRONS
[Ar] 4s¹

BOILS
759 °C

CHARGE
+1



DANGER
4/5 Severe



Potassium is vital for plants and people, found in fertilizer and in foods like bananas.

fertilizer + potassium



Ca

CALCIUM

BONES, TEETH, AND CHALK

MASS
40.078

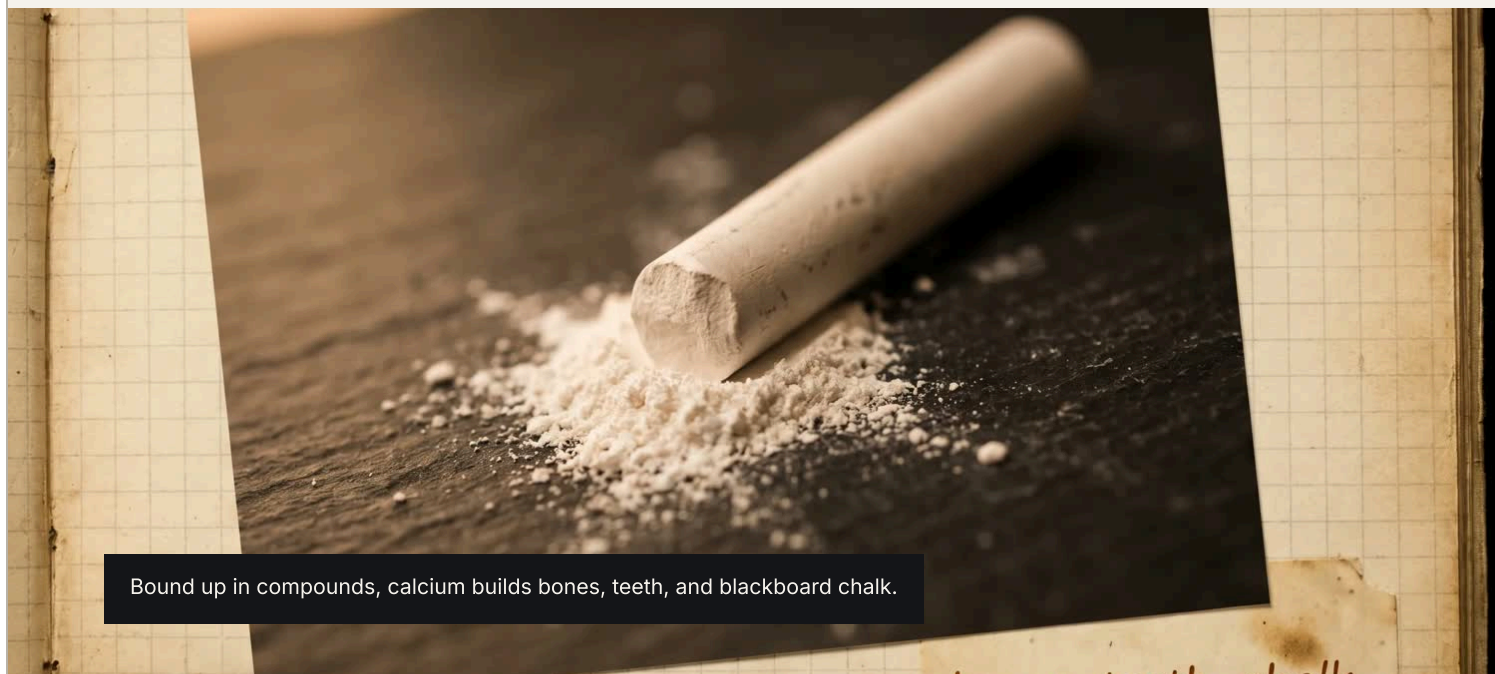
ELECTRONS
[Ar] 4s²

BOILS
1484 °C

CHARGE
+2



DANGER
2/5 Caution



Bound up in compounds, calcium builds bones, teeth, and blackboard chalk.



Sc

SCANDIUM

LIGHTWEIGHT, STRONG, USED IN BASEBALL BATS AND AEROSPACE ALLOYS

MASS
44.956

ELECTRONS
[Ar] 3d¹ 4s²

BOILS
2836 °C

CHARGE
+3



DANGER
1/5 Low risk

Added to aluminum, scandium makes alloys strong and light for aircraft and sports gear.



Ti

TITANIUM

HALF THE WEIGHT OF STEEL AT TWICE THE STRENGTH

MASS

47.867

ELECTRONS

 $[\text{Ar}] 3d^2 4s^2$

BOILS

3287 °C

CHARGE

+2, +3, +4



DANGER

1/5 Low risk



Titanium is strong, light, and body-friendly, so it is used for implants and aircraft.



V

VANADIUM

HARDENS STEEL FOR TOOLS, SPRINGS, AND CRESCENT WRENCHES

MASS

50.942

ELECTRONS

 $[\text{Ar}] 3d^3 4s^2$

BOILS

3407 °C

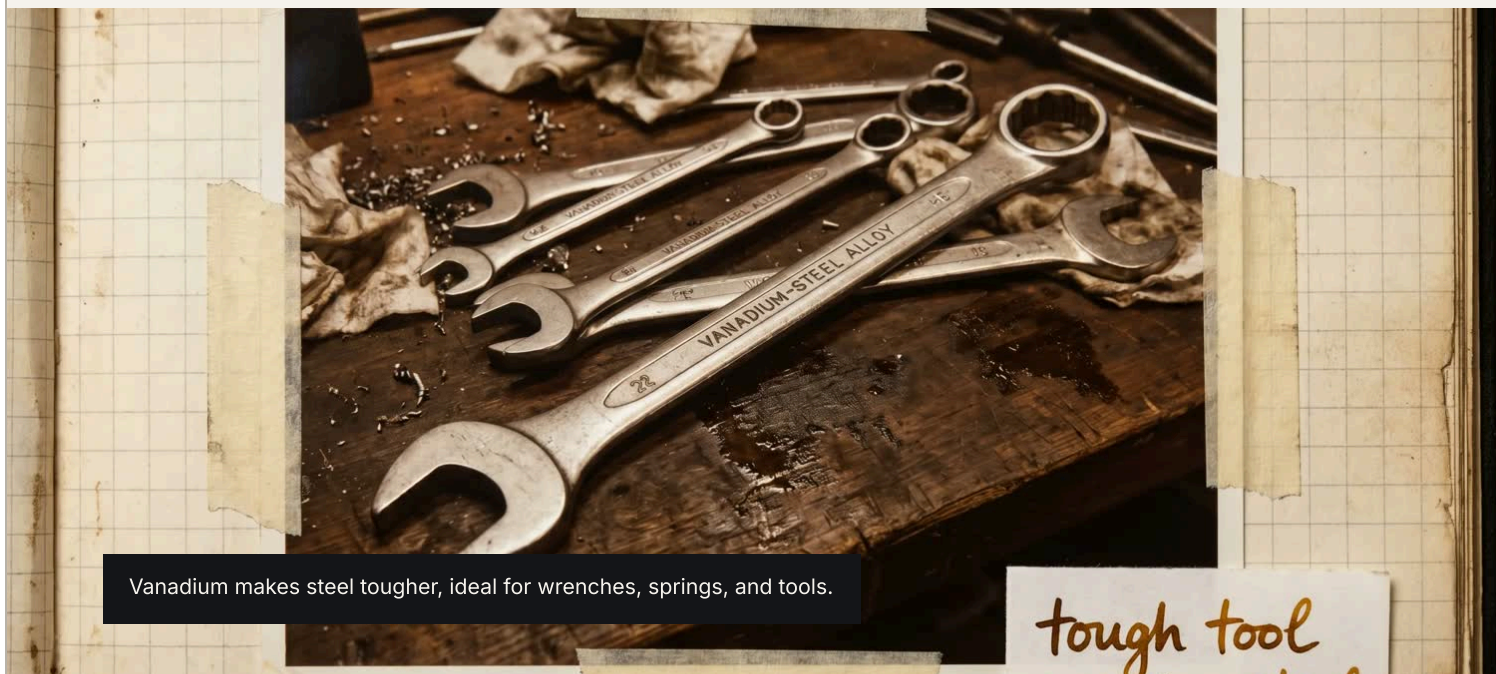
CHARGE

+2, +3, +4, +5



DANGER

2/5 Caution



Vanadium makes steel tougher, ideal for wrenches, springs, and tools.

tough tool



Cr

CHROMIUM

THE SHINE ON A CHROME BUMPER

MASS
51.996

ELECTRONS
[Ar] 3d⁵ 4s¹

BOILS
2671 °C

CHARGE
+2, +3, +6



DANGER
1/5 Low risk

Chrome plating gives metal a shiny, mirror-bright, rust-resistant finish.

shiny chrome
plating



Mn

MANGANESE

HARDENS STEEL BEYOND WHAT CARBON ALONE CAN DO

MASS

54.938

ELECTRONS

 $[\text{Ar}] 3d^5 4s^2$

BOILS

2061 °C

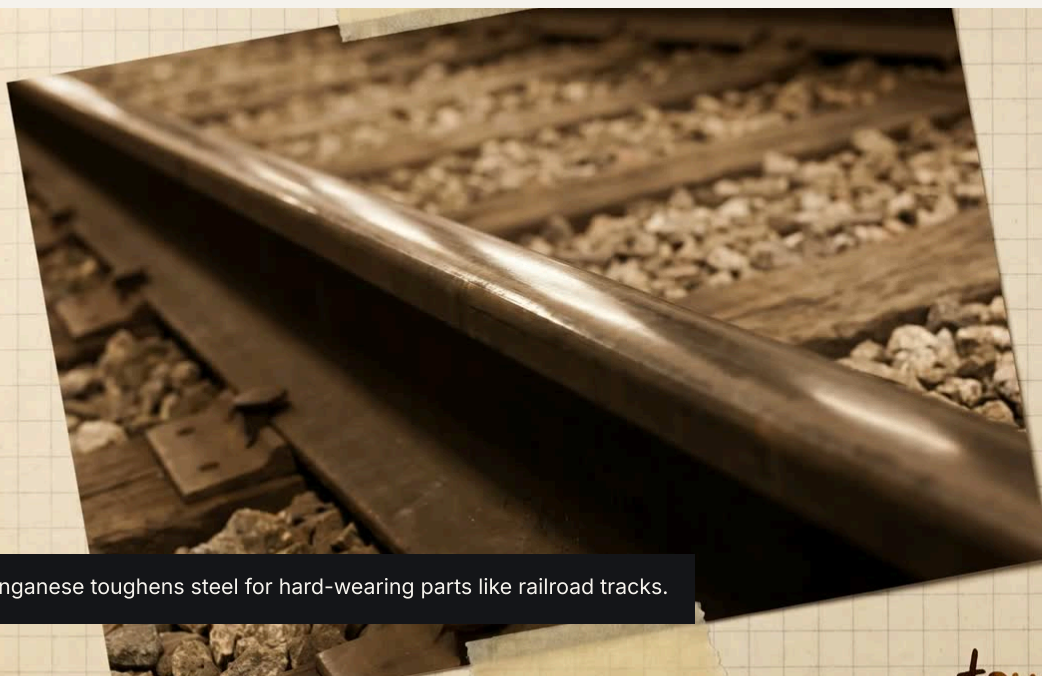
CHARGE

+2, +4, +7



DANGER

2/5 Caution



Manganese toughens steel for hard-wearing parts like railroad tracks.

tough steel



Fe

IRON

MOST-USED METAL ON EARTH

MASS
55.845

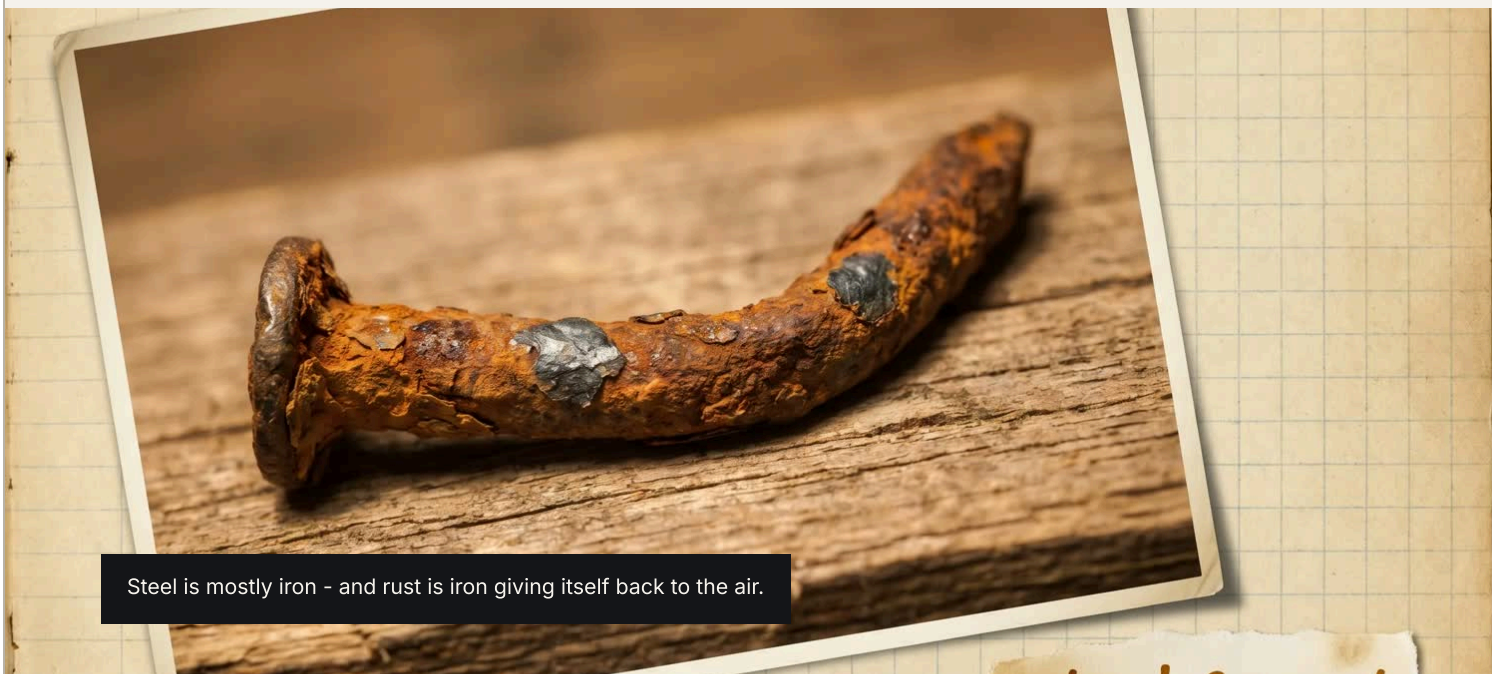
ELECTRONS
[Ar] 3d⁶ 4s²

BOILS
2861 °C

CHARGE
+2, +3



DANGER
1/5 Low risk



Steel is mostly iron - and rust is iron giving itself back to the air.



CO

COBALT

THE BLUE IN COBALT-BLUE GLASS AND RENAISSANCE PAINTINGS

MASS
58.933

ELECTRONS
[Ar] 3d⁷ 4s²

BOILS
2927 °C

CHARGE
+2, +3



DANGER
2/5 Caution



Cobalt compounds create the deep blue color in glass and ceramic glazes.

deep blue glass



Ni

NICKEL

THE METAL IN EVERY STAINLESS-STEEL FORK AND MOST US COINS

MASS

58.693

ELECTRONS

 $[\text{Ar}] 3d^8 4s^2$

BOILS

2913 °C

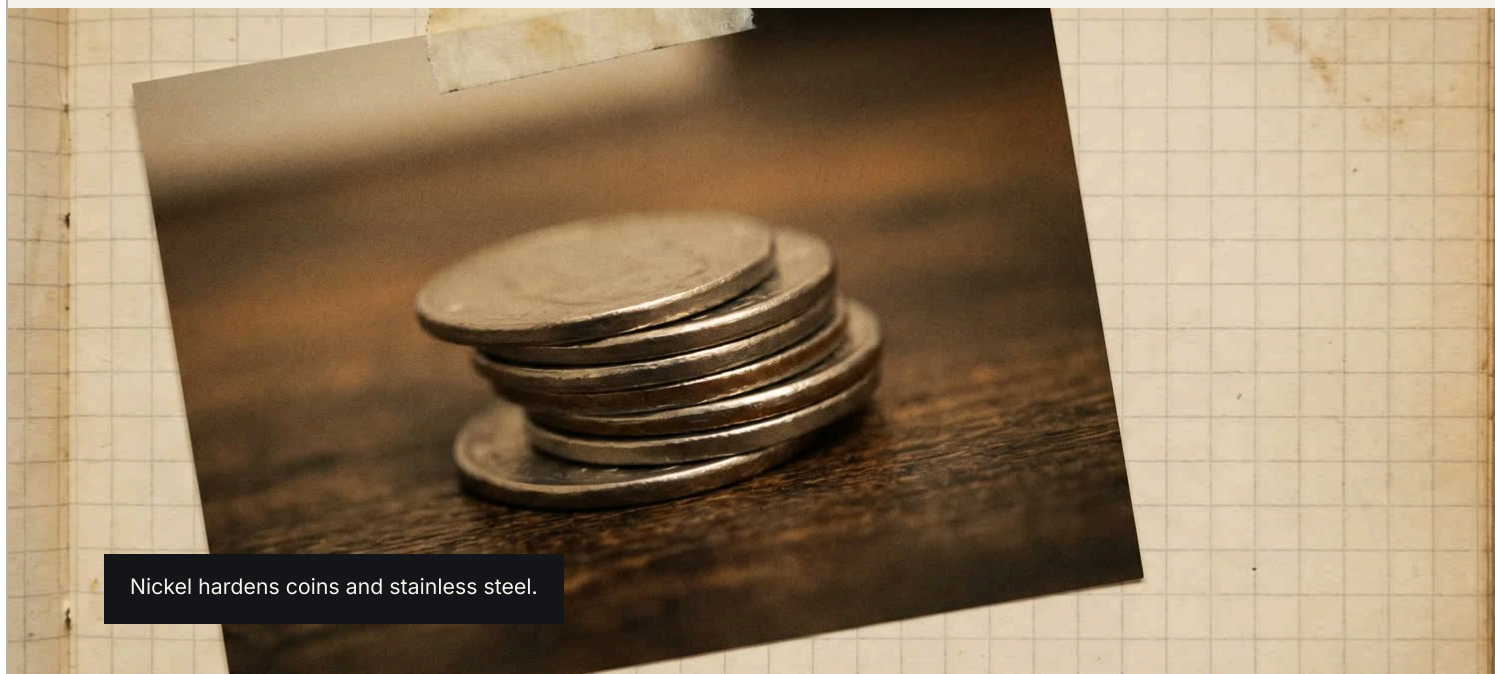
CHARGE

+2



DANGER

2/5 Caution



Nickel hardens coins and stainless steel.



CU

COPPER

REDDISH METAL OF PENNIES, WIRING, AND THE STATUE OF LIBERTY
(THE GREEN IS COPPER CARBONATE FROM OXIDATION)

MASS

63.546

ELECTRONS

[Ar] 3d¹⁰ 4s¹

BOILS

2562 °C

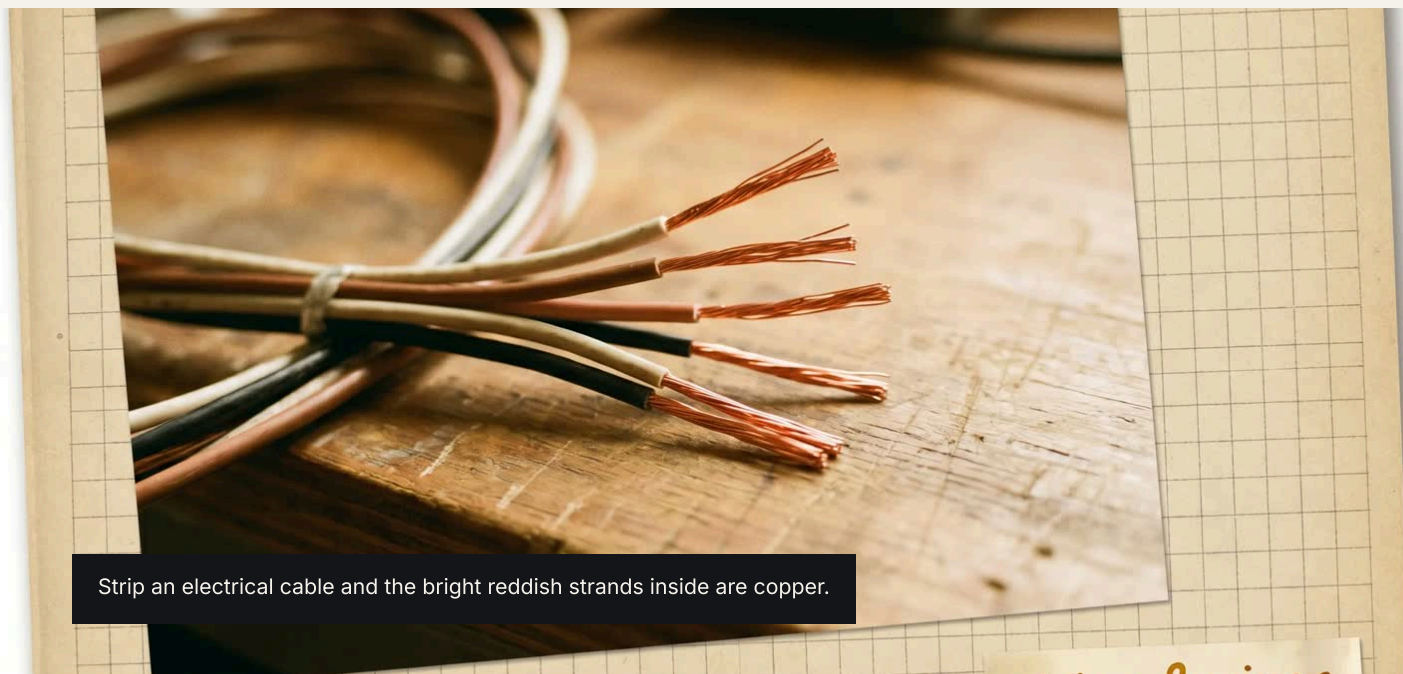
CHARGE

+1, +2



DANGER

1/5 Low risk



Strip an electrical cable and the bright reddish strands inside are copper.



Zn

ZINC

GALVANIZED STEEL RESISTS RUST BECAUSE ZINC OXIDIZES FIRST

MASS

65.38

ELECTRONS

 $[\text{Ar}] 3d^{10} 4s^2$

BOILS

907 °C

CHARGE

+2



DANGER

1/5 Low risk



A zinc coat (galvanizing) is what stops steel buckets and nails from rusting.

galvanising



Ga

GALLIUM

MELTS IN YOUR HAND AT BODY TEMPERATURE (29.8°C)

MASS

69.723

ELECTRONS

[Ar] 3d¹⁰ 4s² 4p¹

BOILS

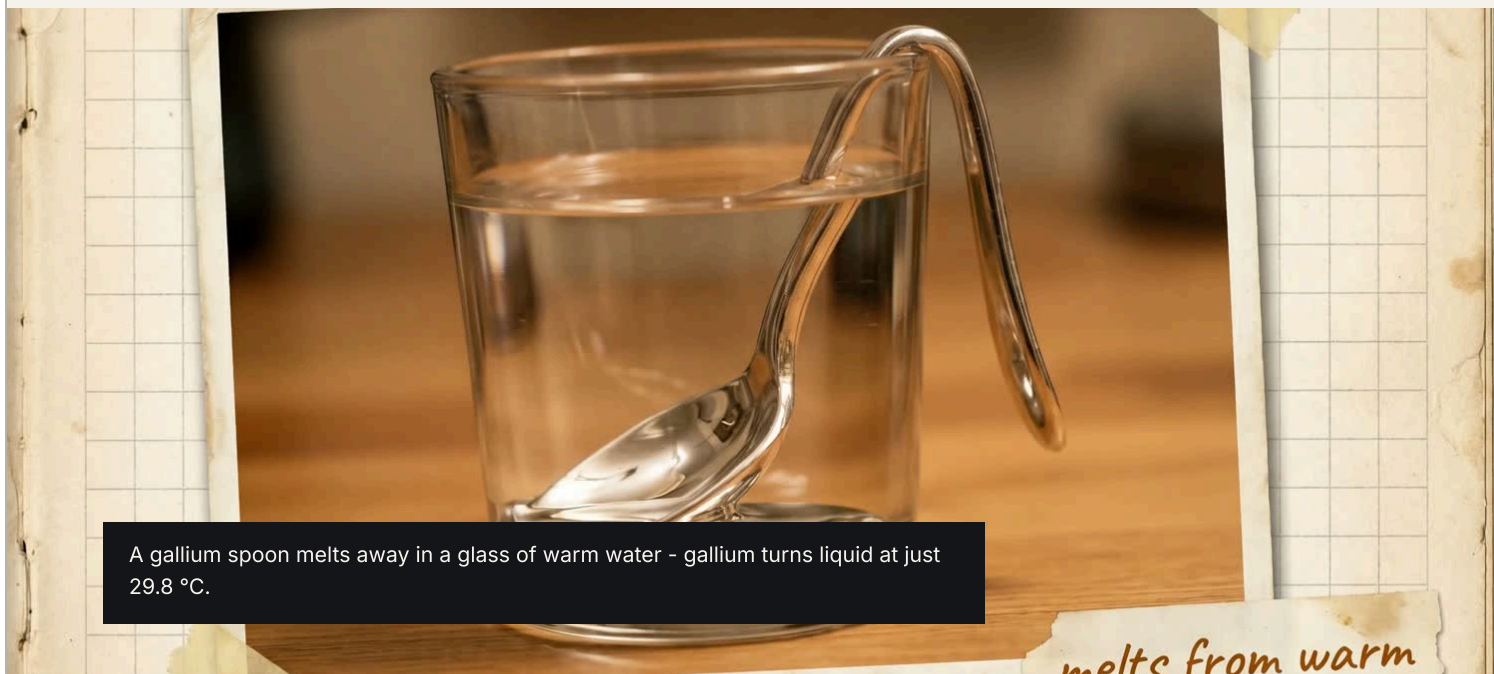
2400 °C

CHARGE

+3

DANGER

0/5 Safe to handle



A gallium spoon melts away in a glass of warm water - gallium turns liquid at just 29.8 °C.

melts from warm



Ge

GERMANIUM

THE ORIGINAL SEMICONDUCTOR ELEMENT - FIRST TRANSISTORS WERE GERMANIUM, NOT SILICON

MASS

72.63

ELECTRONS

 $[\text{Ar}] 3d^{10} 4s^2 4p^2$

BOILS

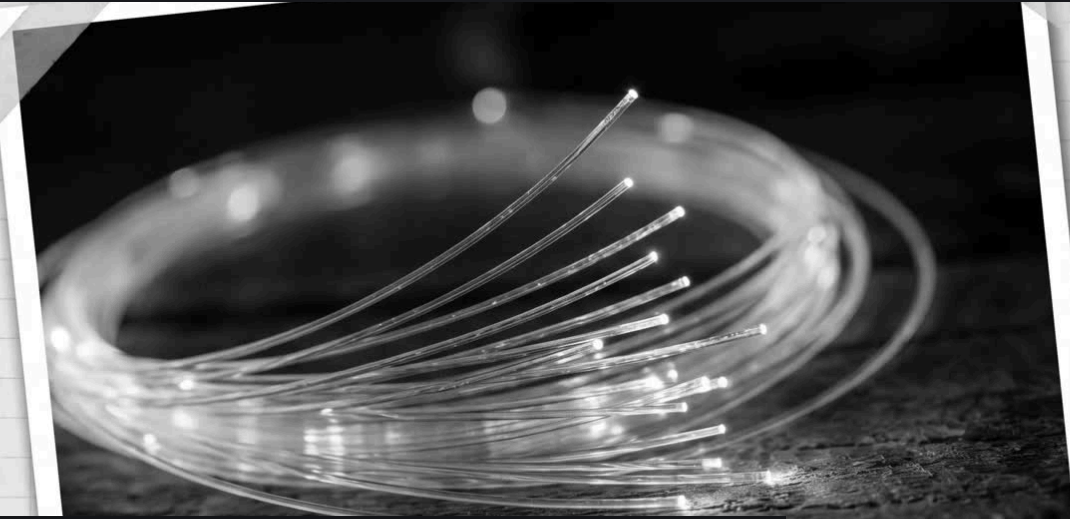
2833 °C

CHARGE

+2, +4

DANGER

0/5 Safe to handle



Germanium carries light through fiber-optic cables and focuses infrared in night-vision lenses.

fiber optics +



As

ARSENIC

THE POISONER'S METALLOID, GROUND-WATER CONTAMINANT IN BANGLADESH, SEMICONDUCTOR DOPANT IN SOLAR CELLS

MASS

74.922

ELECTRONS

 $[\text{Ar}] 3d^{10} 4s^2 4p^3$

BOILS

614 °C

CHARGE

-3, +3, +5



DANGER

4/5 Severe



Arsenic compounds once preserved outdoor lumber against rot - its toxicity also made it a poison.



Se

SELENIUM

IN PHOTOCOPIER DRUMS (LIGHT HITS SE, CHARGE FLOWS)

MASS
78.971

ELECTRONS
[Ar] 3d¹⁰ 4s² 4p⁴

BOILS
685 °C

CHARGE
-2, +4, +6



DANGER
3/5 Hazardous



Selenium gives glass a deep ruby-red color, used in art glass and signal lenses.

*colors glass a
ruby red*



Br

BROMINE

THE ONLY LIQUID NONMETAL AT ROOM TEMPERATURE

MASS
79.904

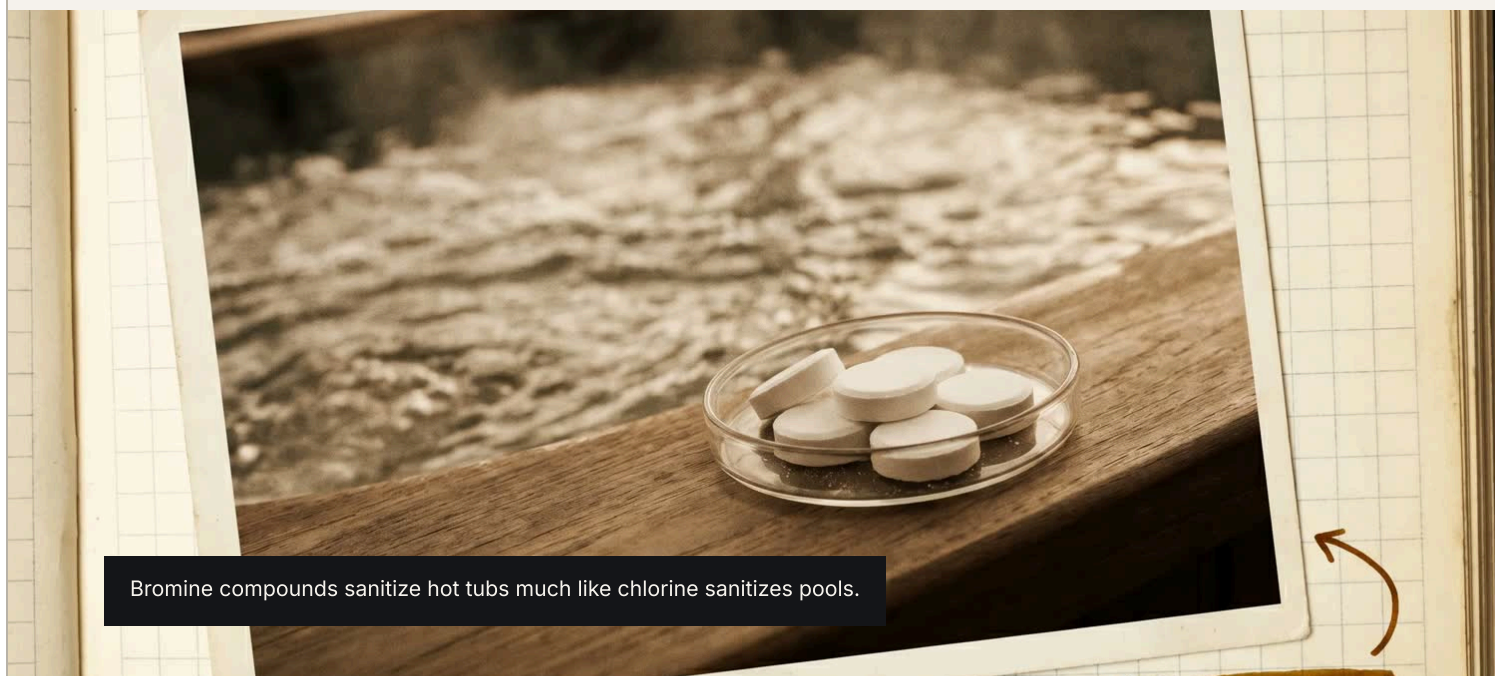
ELECTRONS
[Ar] 3d¹⁰ 4s² 4p⁵

BOILS
59 °C

CHARGE
-1, +1, +3, +5, +7



DANGER
4/5 Severe



Bromine compounds sanitize hot tubs much like chlorine sanitizes pools.



Kr

KRYPTON

INERT NOBLE GAS

MASS

83.798

ELECTRONS

 $[\text{Ar}] 3d^{10} 4s^2 4p^6$

BOILS

 $-153\text{ }^{\circ}\text{C}$

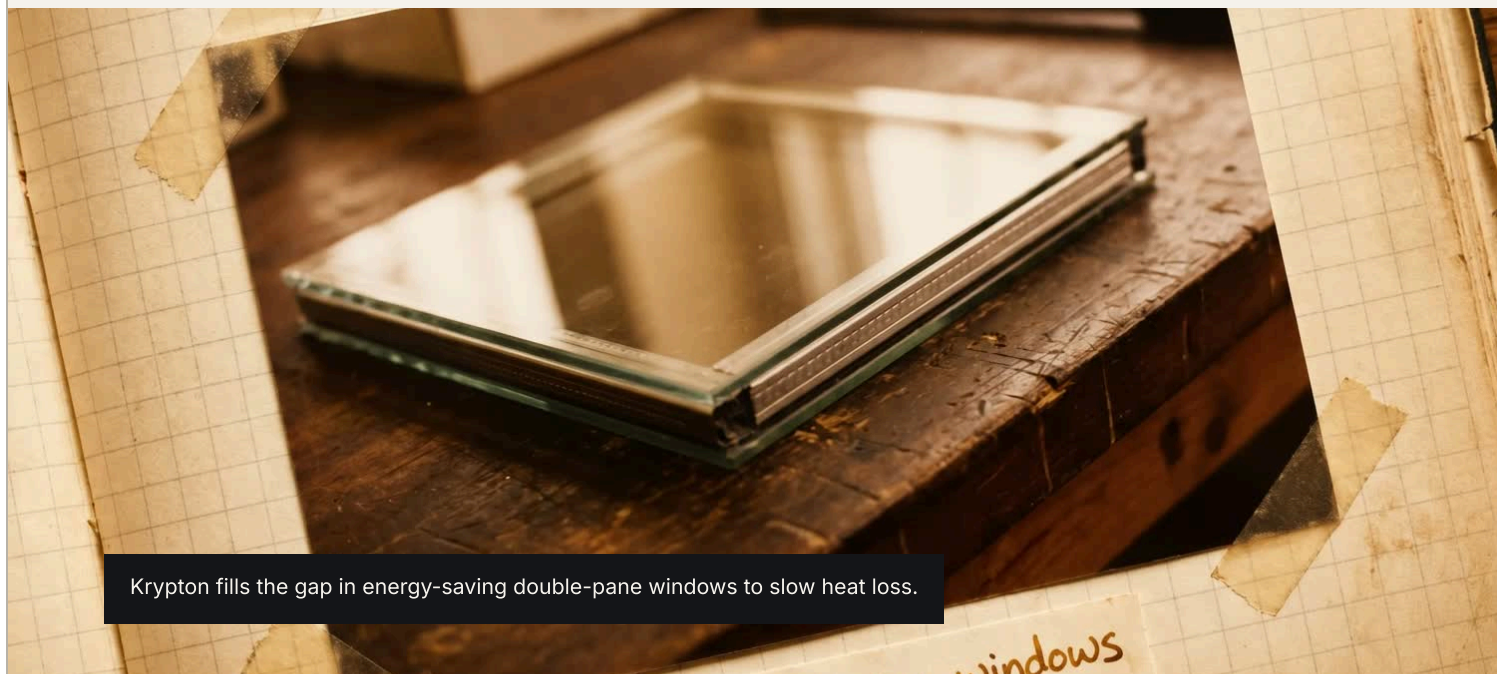
CHARGE

0, +2



DANGER

1/5 Low risk



Krypton fills the gap in energy-saving double-pane windows to slow heat loss.



Rb

RUBIDIUM

EVEN MORE REACTIVE THAN POTASSIUM - ALKALI METAL TREND CONTINUES

MASS
85.468

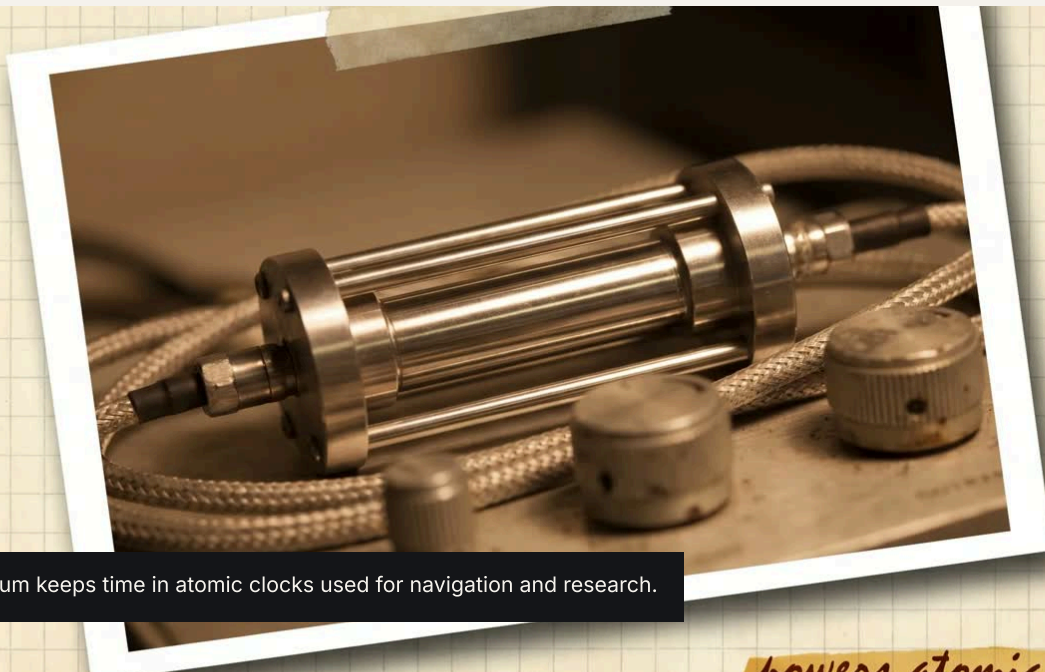
ELECTRONS
[Kr] 5s¹

BOILS
688 °C

CHARGE
+1



DANGER
5/5 Extreme



Rubidium keeps time in atomic clocks used for navigation and research.

powers atomic clocks



Sr

STRONTIUM

THE BRIGHT RED IN FIREWORKS AND OLD TV PHOSPHORS

MASS
87.62

ELECTRONS
[Kr] 5s²

BOILS
1382 °C

CHARGE
+2



DANGER
2/5 Caution



Strontium burns crimson red - it is what makes red fireworks and flares red.



Y

YTTRIUM

YTTRIUM-ALUMINUM-GARNET (YAG) LASERS CUT STEEL AND TATTOO SKIN

MASS

88.906

ELECTRONS

[Kr] 4d¹ 5s²

BOILS

3345 °C

CHARGE

+3



DANGER

1/5 Low risk



Yttrium phosphors help white LEDs glow and once made the red in old TV screens.

phosphors in
white LEDs



Zr

ZIRCONIUM

CUBIC ZIRCONIA IN THE ENGAGEMENT-RING CASE

MASS
91.224

ELECTRONS
[Kr] 4d² 5s²

BOILS
4409 °C

CHARGE
+4



DANGER
2/5 Caution



Cubic zirconia - made from a zirconium oxide - sparkles like diamond for a fraction of the cost.

cubic zirconia



Nb

NIOBIUM

SUPERCONDUCTING MAGNETS IN MRI MACHINES AND THE LHC

MASS
92.906

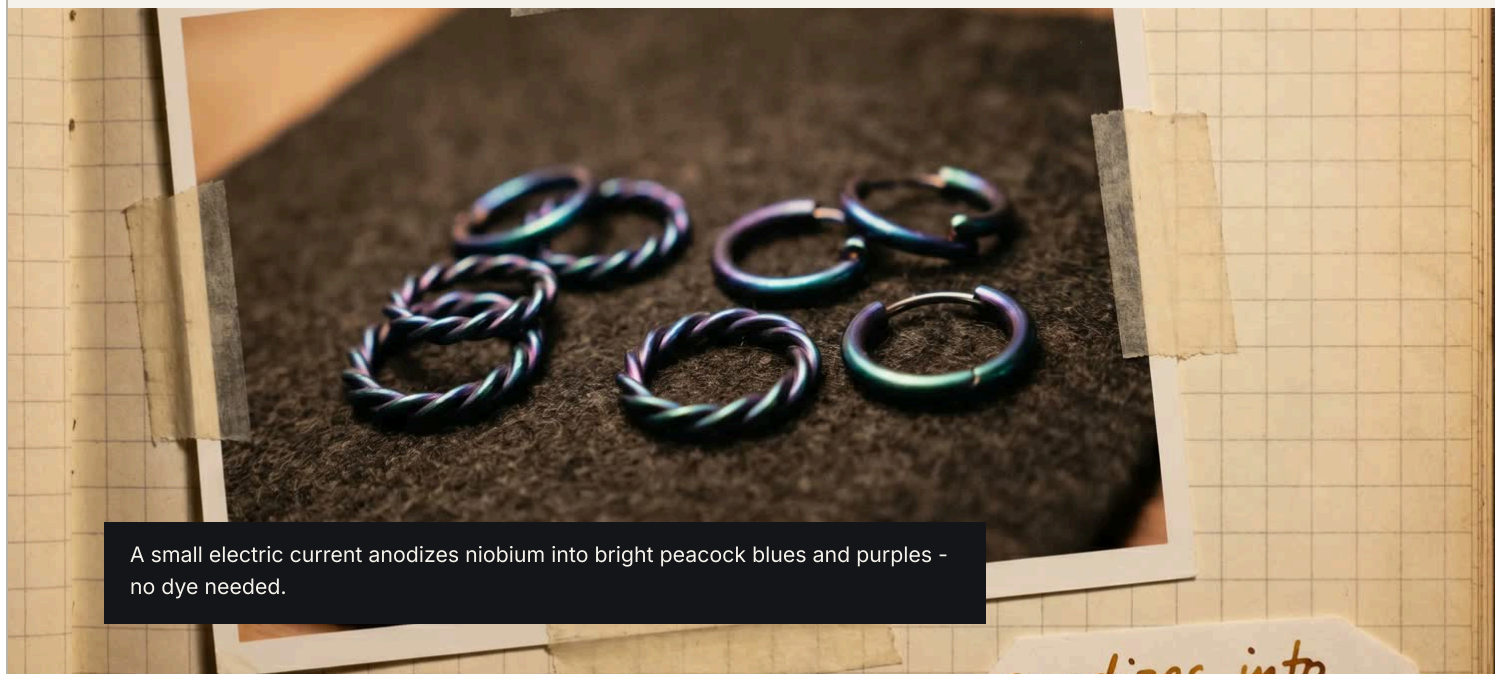
ELECTRONS
[Kr] 4d⁴ 5s¹

BOILS
4744 °C

CHARGE
+3, +5



DANGER
1/5 Low risk



A small electric current anodizes niobium into bright peacock blues and purples - no dye needed.



MO

MOLYBDENUM

THE MO IN “MOLY” - MOLYBDENUM-STEEL ARMOR PLATE, JET-ENGINE ALLOYS, AND THE STUFF THAT HARDENS DRILL BITS

MASS

95.95

ELECTRONS

[Kr] 4d⁵ 5s¹

BOILS

4639 °C

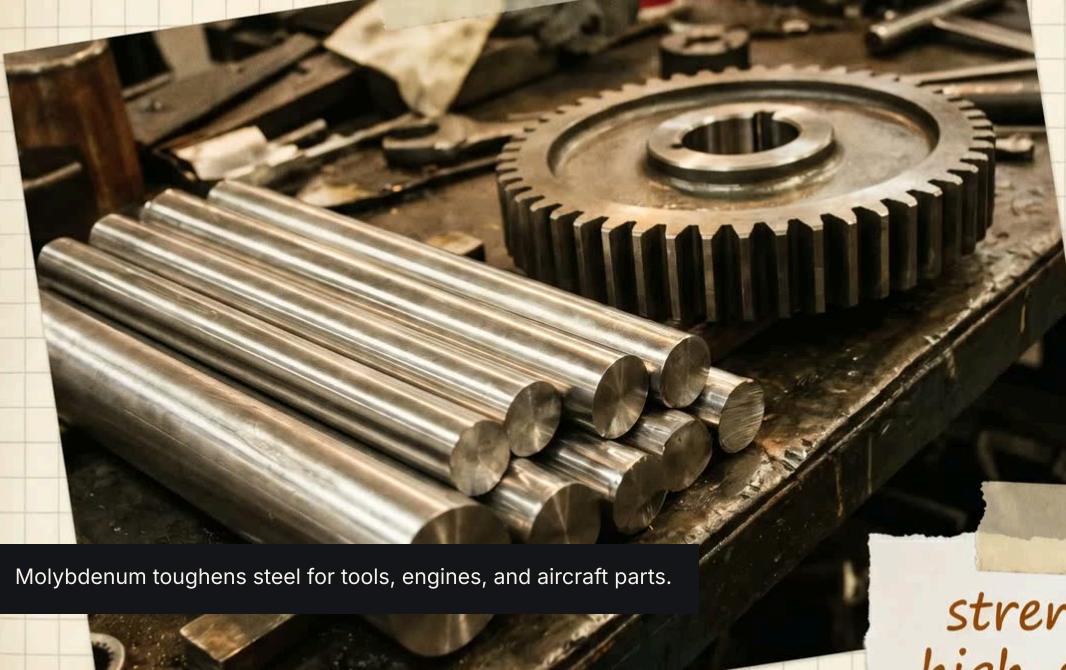
CHARGE

+4, +6



DANGER

1/5 Low risk

A photograph showing several cylindrical metal rods of varying lengths and diameters, along with a large gear, resting on a dark metal workbench. The background is a grid pattern.

Molybdenum toughens steel for tools, engines, and aircraft parts.

strengthens
high strength



Tc

TECHNETIUM

THE FIRST SYNTHETIC ELEMENT - NO STABLE ISOTOPES EXIST ON EARTH

MASS

[98]

ELECTRONS

[Kr] 4d⁵ 5s²

BOILS

4265 °C

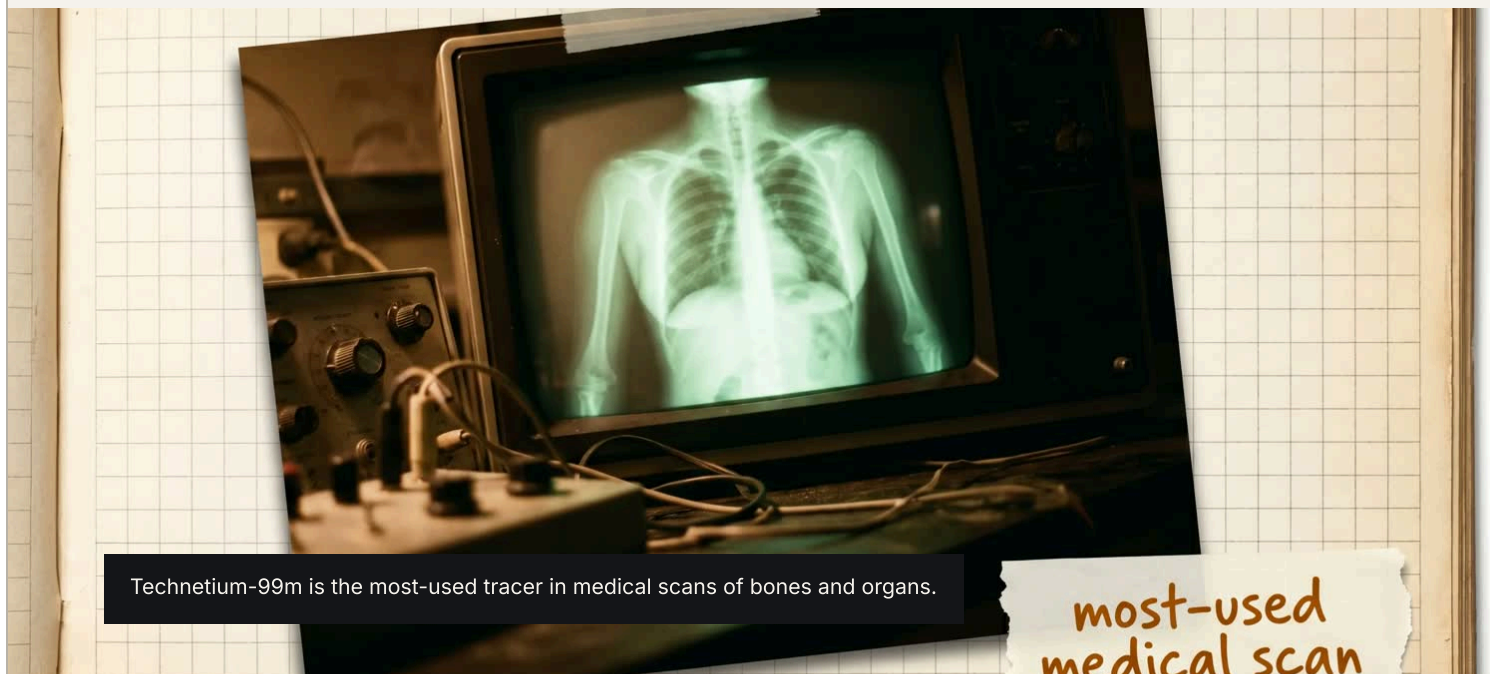
CHARGE

+4, +7



DANGER

4/5 Severe



Technetium-99m is the most-used tracer in medical scans of bones and organs.

most-used
medical scan



RU

RUTHENIUM

CATALYZES HYDROGEN FUEL CELLS

MASS
101.07

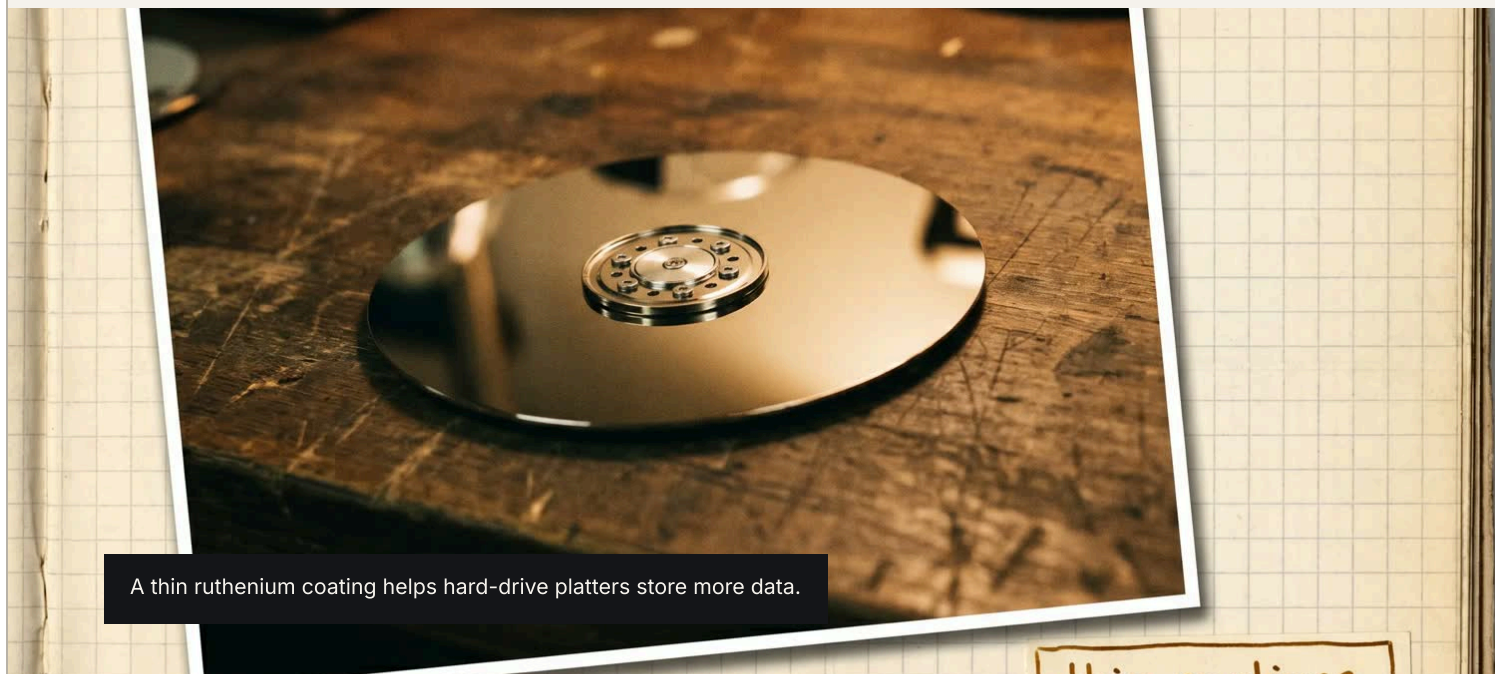
ELECTRONS
[Kr] 4d⁷ 5s¹

BOILS
4150 °C

CHARGE
+3, +4, +8



DANGER
1/5 Low risk



A thin ruthenium coating helps hard-drive platters store more data.



Rh

RHODIUM

CATALYTIC CONVERTER ON EVERY GASOLINE CAR

MASS

102.91

ELECTRONS

[Kr] 4d⁸ 5s¹

BOILS

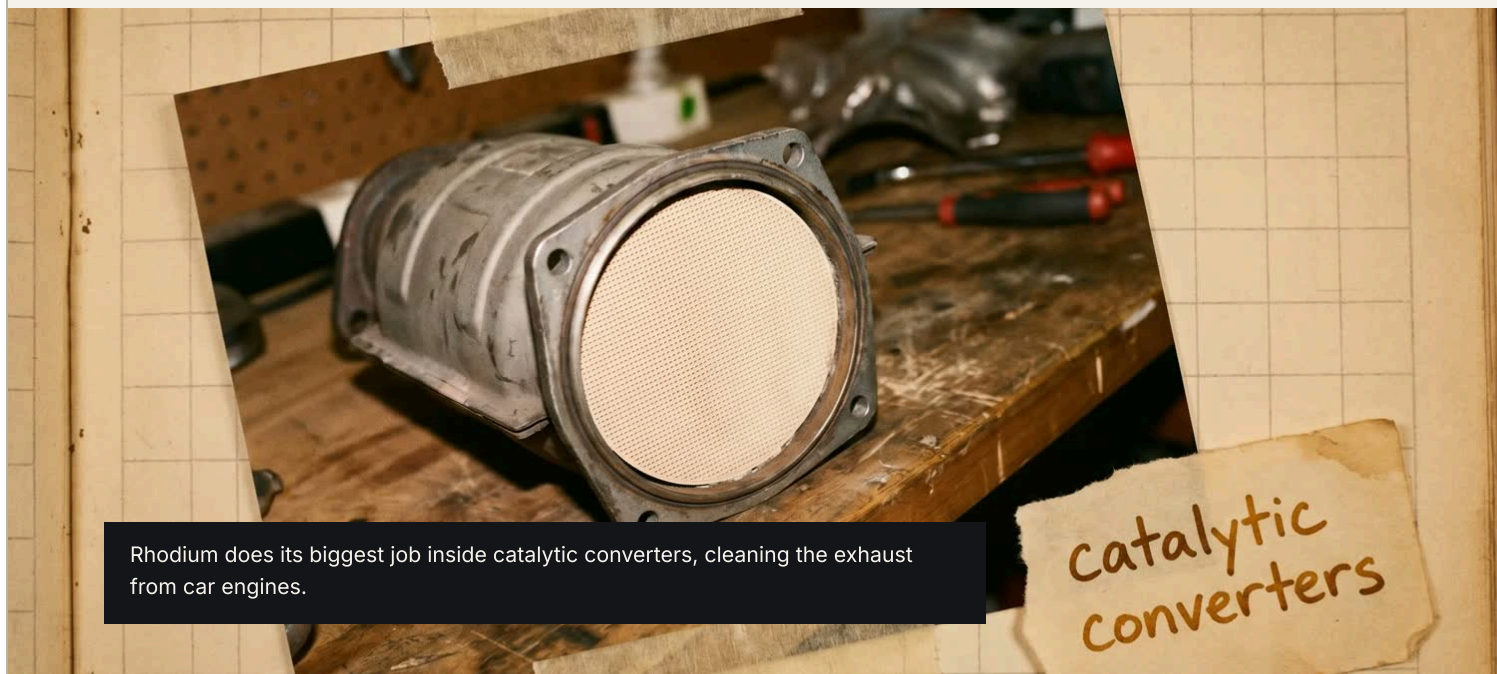
3695 °C

CHARGE

+3

DANGER

0/5 Safe to handle



Rhodium does its biggest job inside catalytic converters, cleaning the exhaust from car engines.



Pd

PALLADIUM

CATALYTIC CONVERTERS SCRUB CAR EXHAUST CLEAN

MASS
106.42

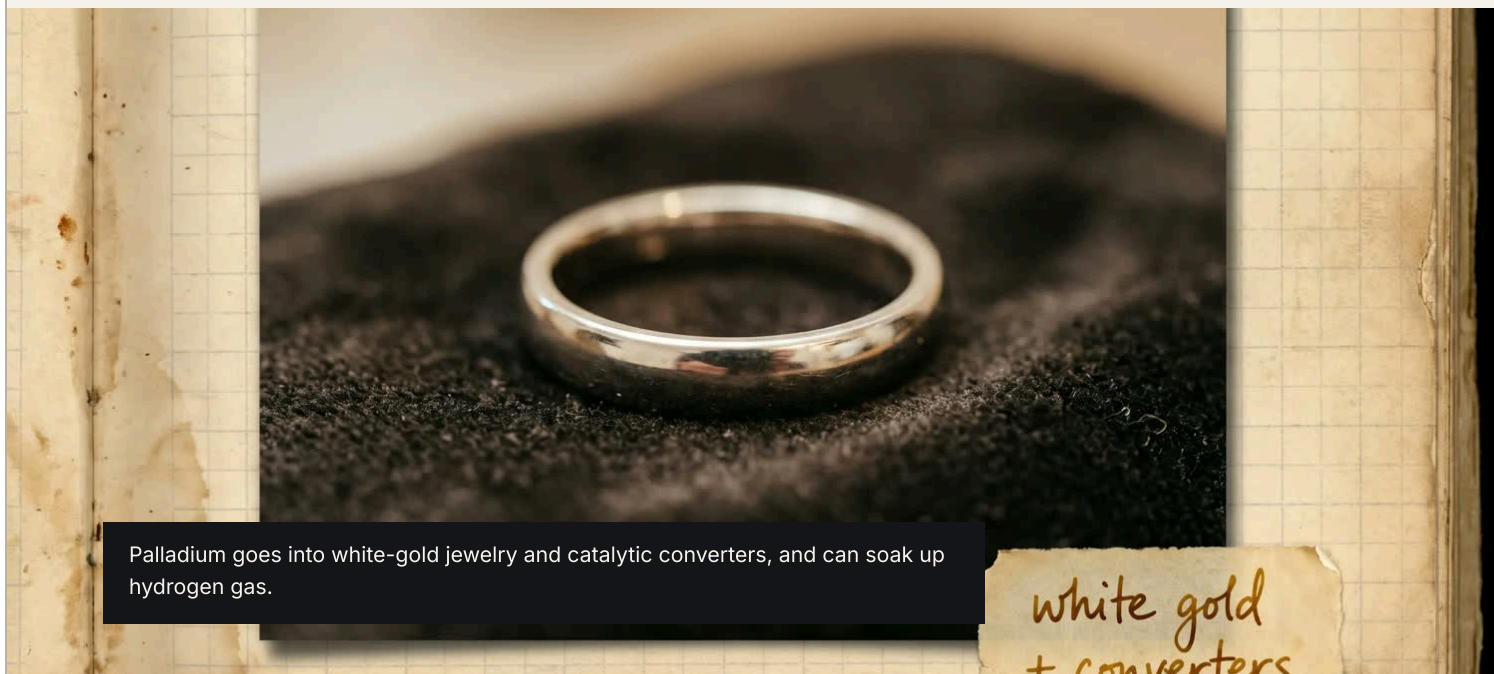
ELECTRONS
[Kr] 4d¹⁰

BOILS
2963 °C

CHARGE
+2, +4



DANGER
1/5 Low risk



Palladium goes into white-gold jewelry and catalytic converters, and can soak up hydrogen gas.

white gold
+ converters



Ag

SILVER

BEST ELECTRICAL AND THERMAL CONDUCTOR OF ANY METAL

MASS

107.87

ELECTRONS

[Kr] 4d¹⁰ 5s¹

BOILS

2162 °C

CHARGE

+1



DANGER

1/5 Low risk

Jewelry, cutlery, and mirrors - silver tarnishes dark but polishes back to a bright shine.

*jewellery,
cutlery.*



Cd

CADMIUM

YELLOW-ORANGE PAINT PIGMENT USED BY MONET AND VAN GOGH -
ALSO A HEAVY-METAL POISON THAT CROSSES THE PLACENTA

MASS

112.41

ELECTRONS

 $[\text{Kr}] 4d^{10} 5s^2$

BOILS

767 °C

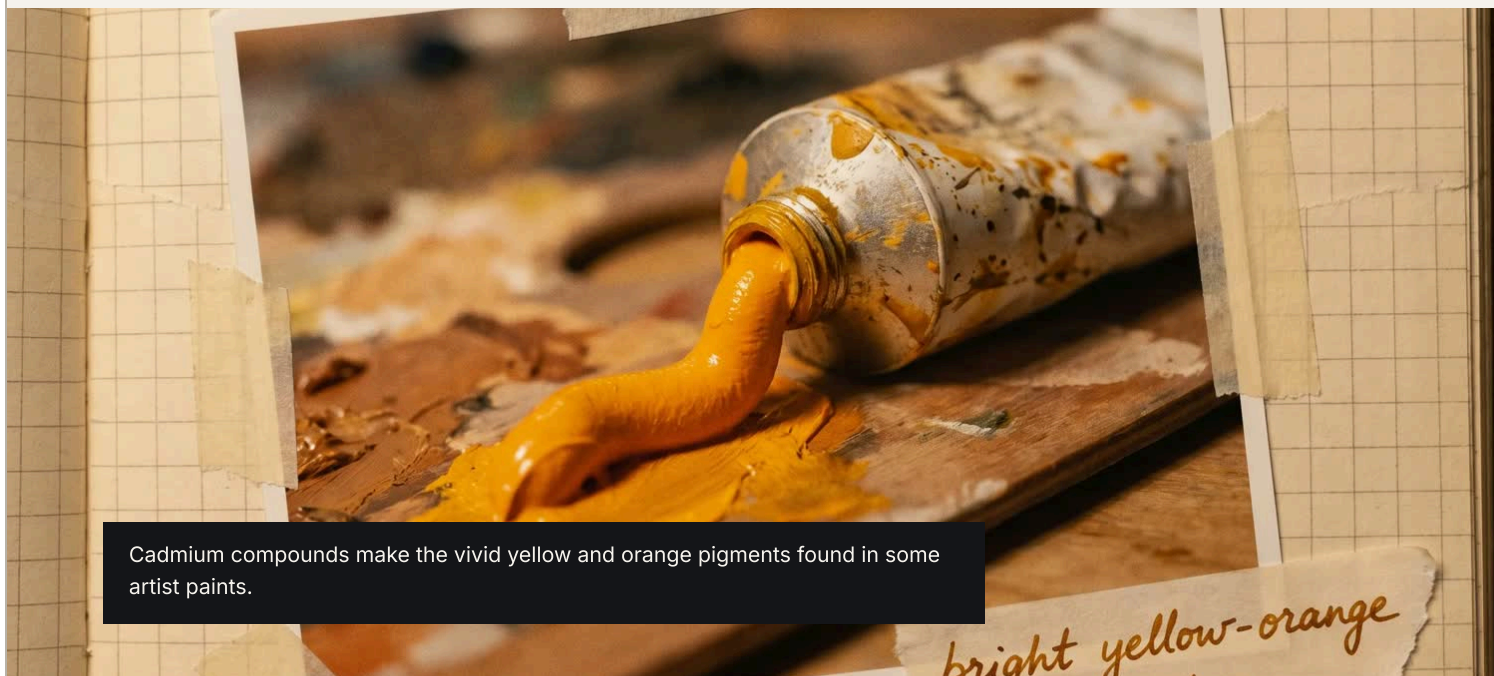
CHARGE

+2

DANGER



3/5 Hazardous



Cadmium compounds make the vivid yellow and orange pigments found in some artist paints.



In

INDIUM

INDIUM-TIN-OXIDE (ITO) IS THE TRANSPARENT CONDUCTOR IN EVERY TOUCHSCREEN, OLED, AND SOLAR PANEL

MASS

114.82

ELECTRONS

 $[\text{Kr}] 4d^{10} 5s^2 5p^1$

BOILS

2072 °C

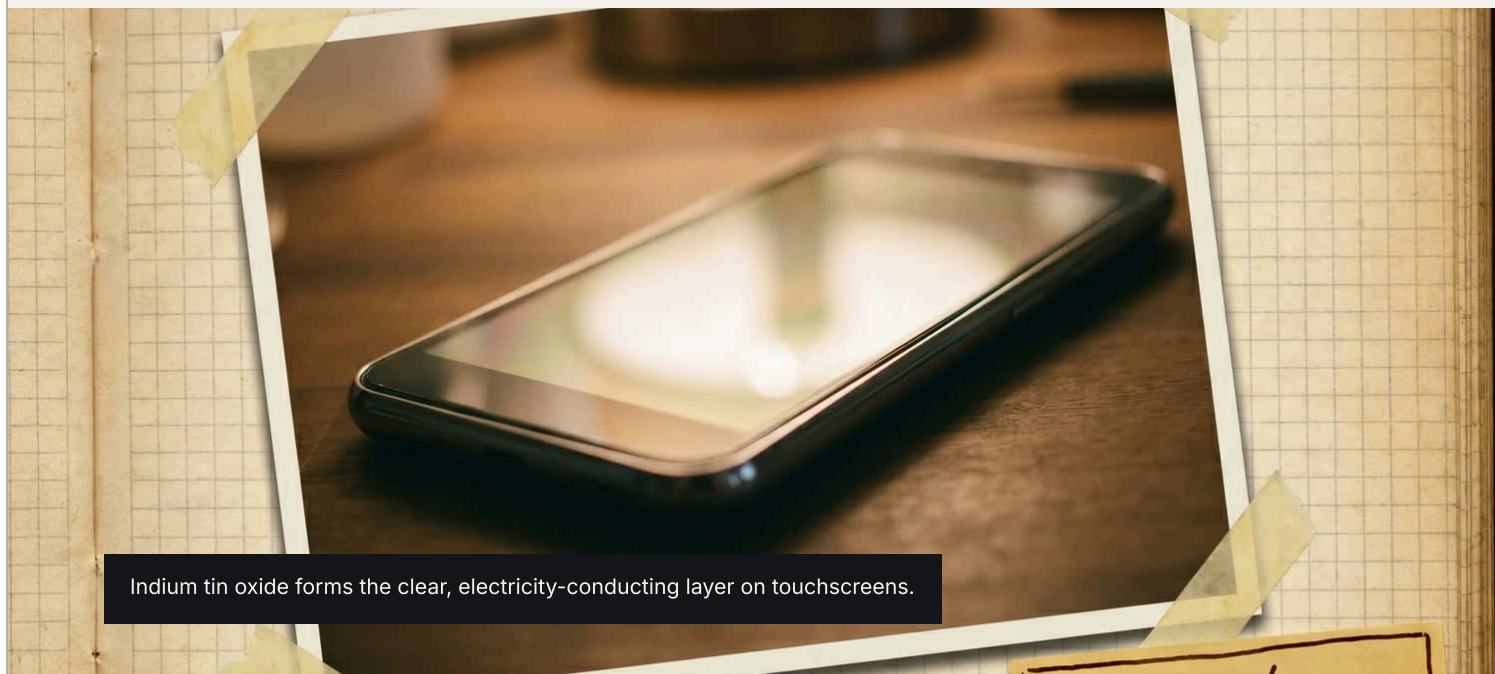
CHARGE

+3



DANGER

1/5 Low risk



Indium tin oxide forms the clear, electricity-conducting layer on touchscreens.



Sn

TIN

BRONZE IS COPPER + TIN

MASS
118.71

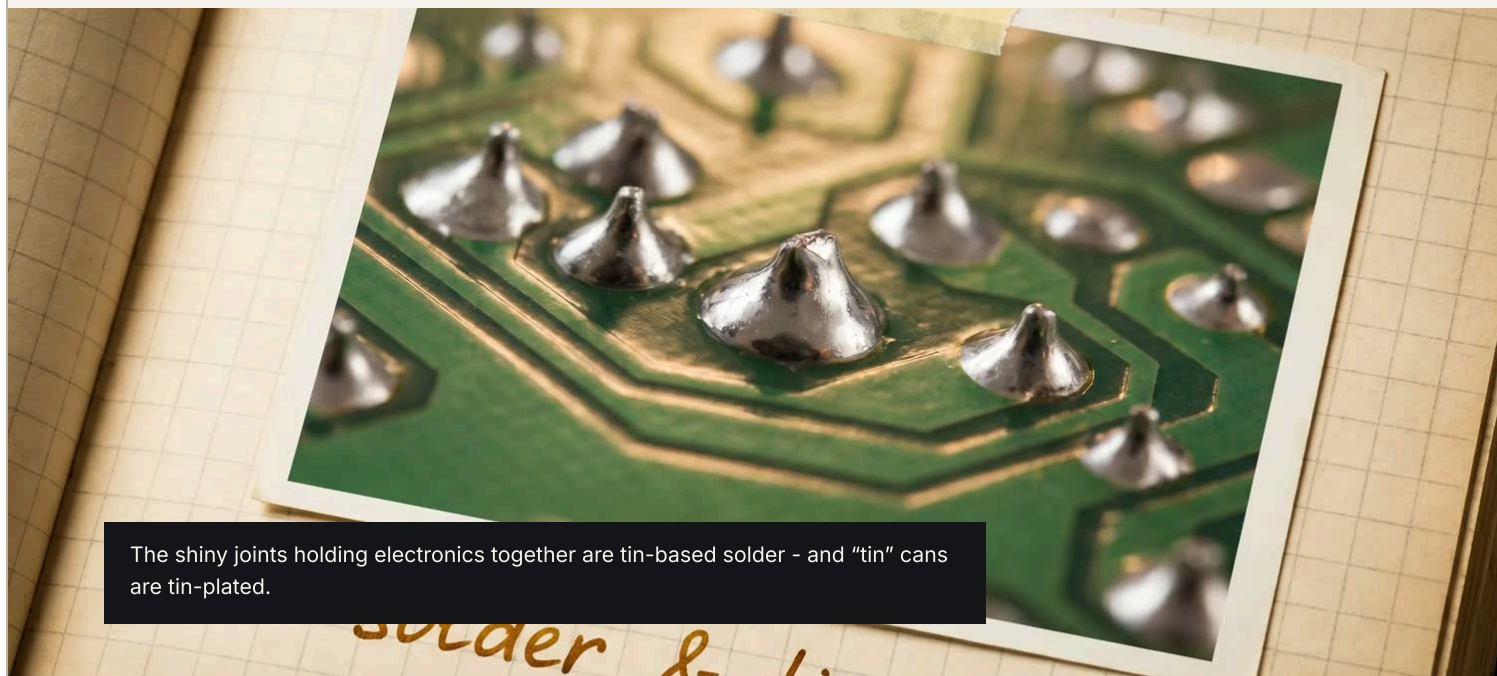
ELECTRONS
[Kr] 4d¹⁰ 5s² 5p²

BOILS
2602 °C

CHARGE
+2, +4



DANGER
1/5 Low risk



The shiny joints holding electronics together are tin-based solder - and "tin" cans are tin-plated.



Sb

ANTIMONY

BRITTLE METALLOID

MASS

121.76

ELECTRONS

 $[\text{Kr}] 4d^{10} 5s^2 5p^3$

BOILS

1587 °C

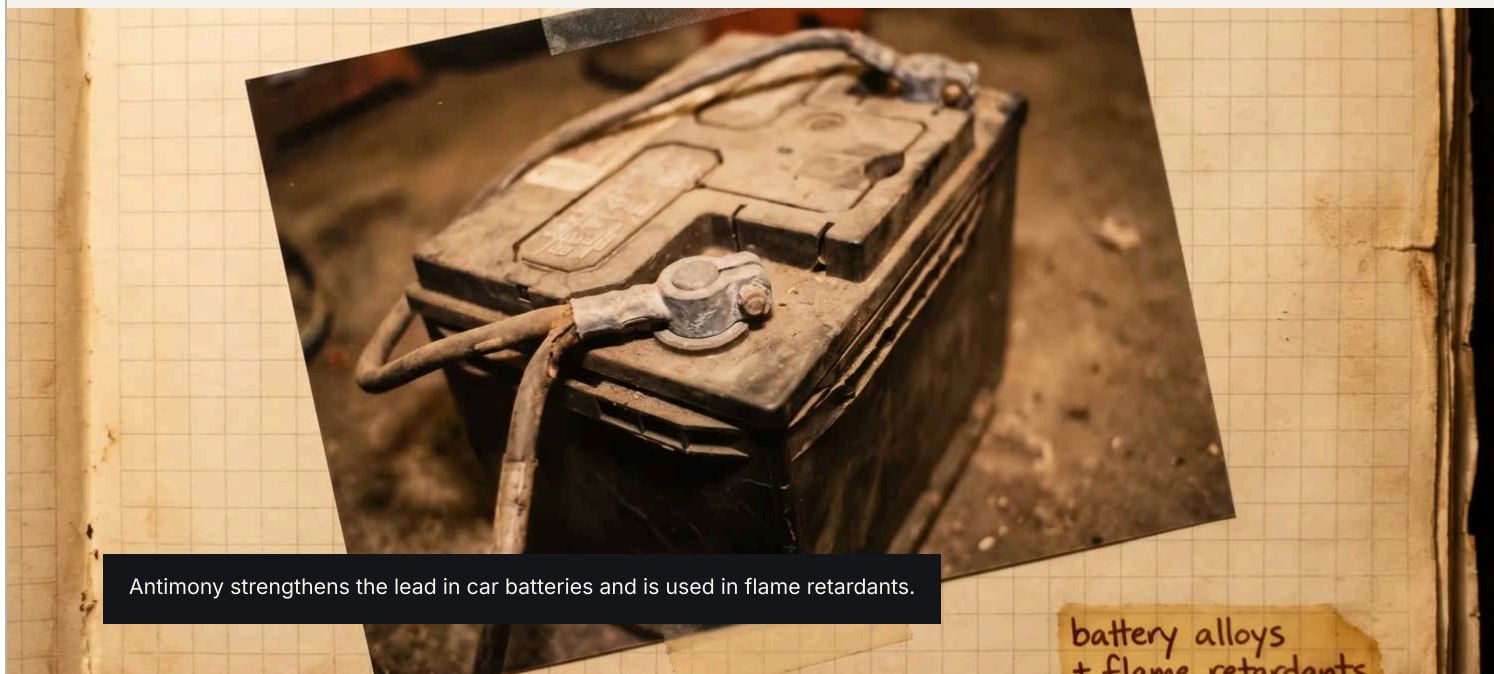
CHARGE

-3, +3, +5

DANGER



3/5 Hazardous



Antimony strengthens the lead in car batteries and is used in flame retardants.

battery alloys
+ flame retardants



Te

TELLURIUM

THE EARTH-NAMED TWIN OF SELENIUM (THE MOON)

MASS
127.6

ELECTRONS
[Kr] 4d¹⁰ 5s² 5p⁴

BOILS
988 °C

CHARGE
-2, +4, +6



DANGER
3/5 Hazardous

Cadmium telluride is used to make thin-film solar panels that turn sunlight into power.



I

IODINE

ANTISEPTIC TINCTURE ON EVERY BATTLEFIELD WOUND UNTIL WWII

MASS

126.9

ELECTRONS

 $[\text{Kr}] 4d^{10} 5s^2 5p^5$

BOILS

184 °C

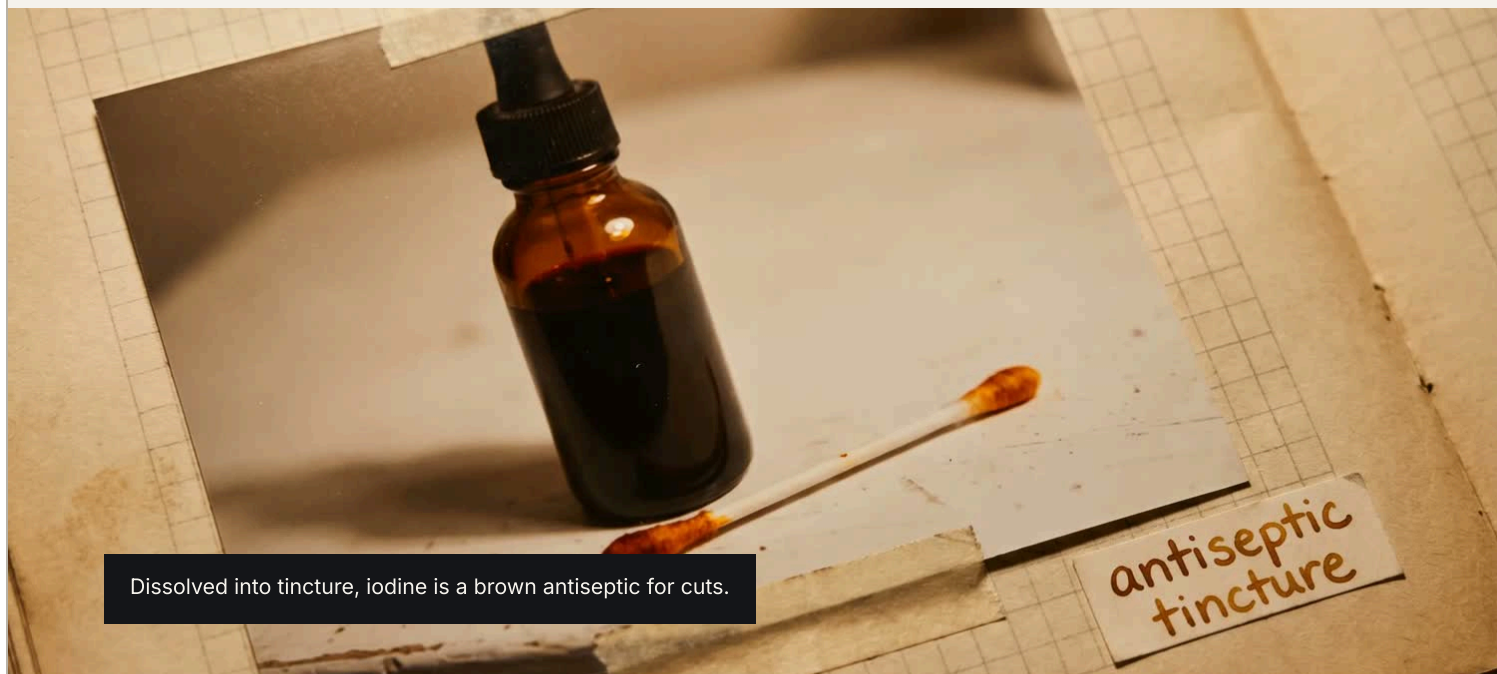
CHARGE

-1, +1, +3, +5, +7



DANGER

2/5 Caution



Dissolved into tincture, iodine is a brown antiseptic for cuts.



Xe

XENON

HIGH-INTENSITY HEADLAMPS ON LUXURY CARS

MASS

131.29

ELECTRONS

 $[\text{Kr}] 4d^{10} 5s^2 5p^6$

BOILS

-108 °C

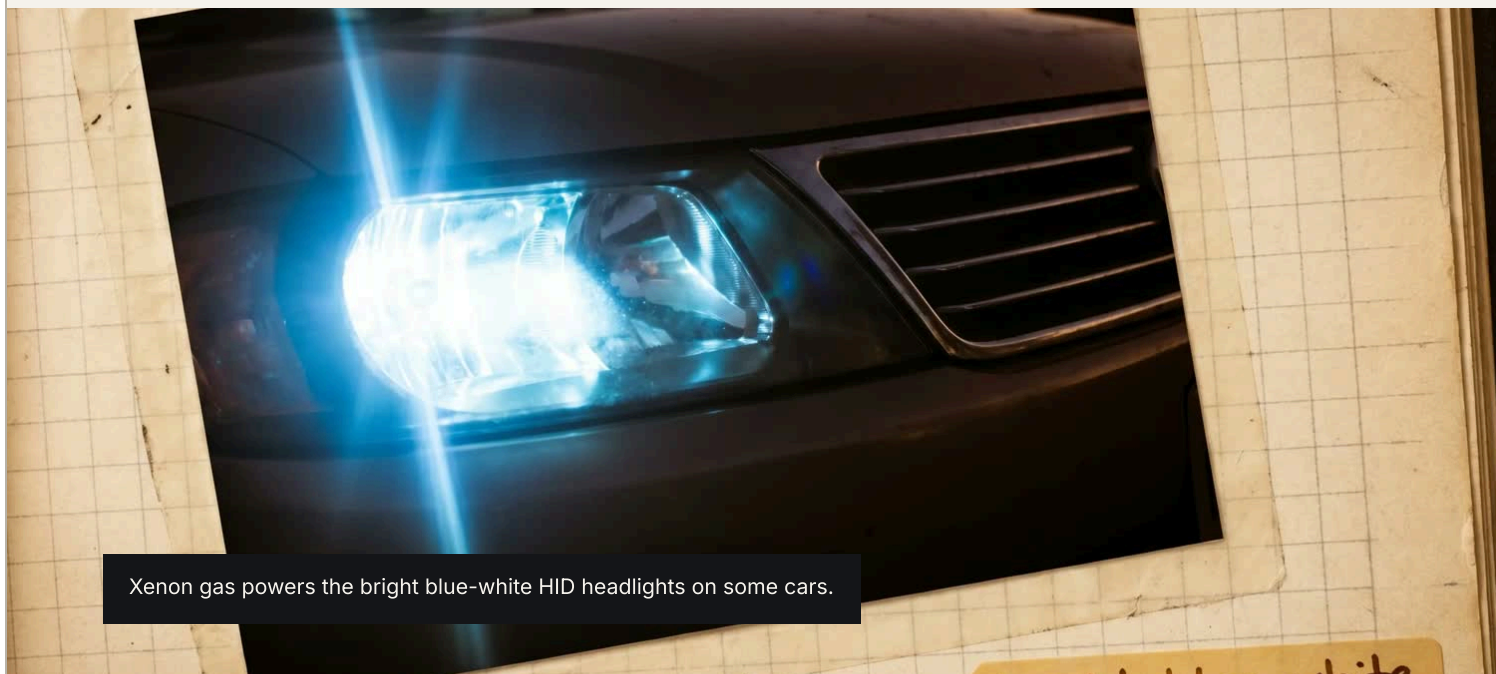
CHARGE

0, +2, +4, +6, +8



DANGER

1/5 Low risk



Xenon gas powers the bright blue-white HID headlights on some cars.



Cs

CESIUM

THE ATOMIC-CLOCK ELEMENT - THE SECOND IS DEFINED BY CESIUM-133 HYPERFINE TRANSITIONS

MASS

132.91

ELECTRONS

 $[Xe] 6s^1$

BOILS

671 °C

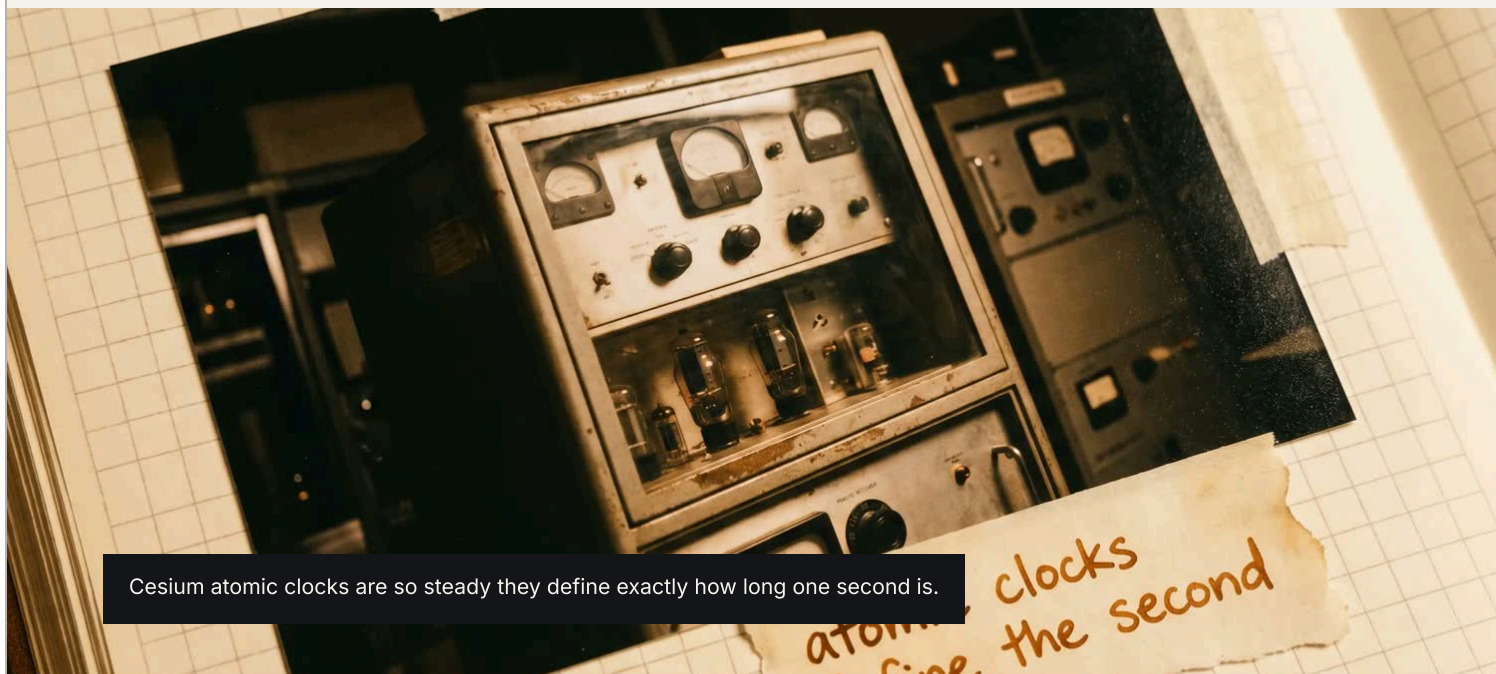
CHARGE

+1



DANGER

5/5 Extreme



Cesium atomic clocks are so steady they define exactly how long one second is.



Ba

BARIUM

THE “BARIUM SWALLOW” FOR X-RAY IMAGING - DENSE ENOUGH TO BLOCK X-RAYS

MASS

137.33

ELECTRONS

[Xe] 6s²

BOILS

1845 °C

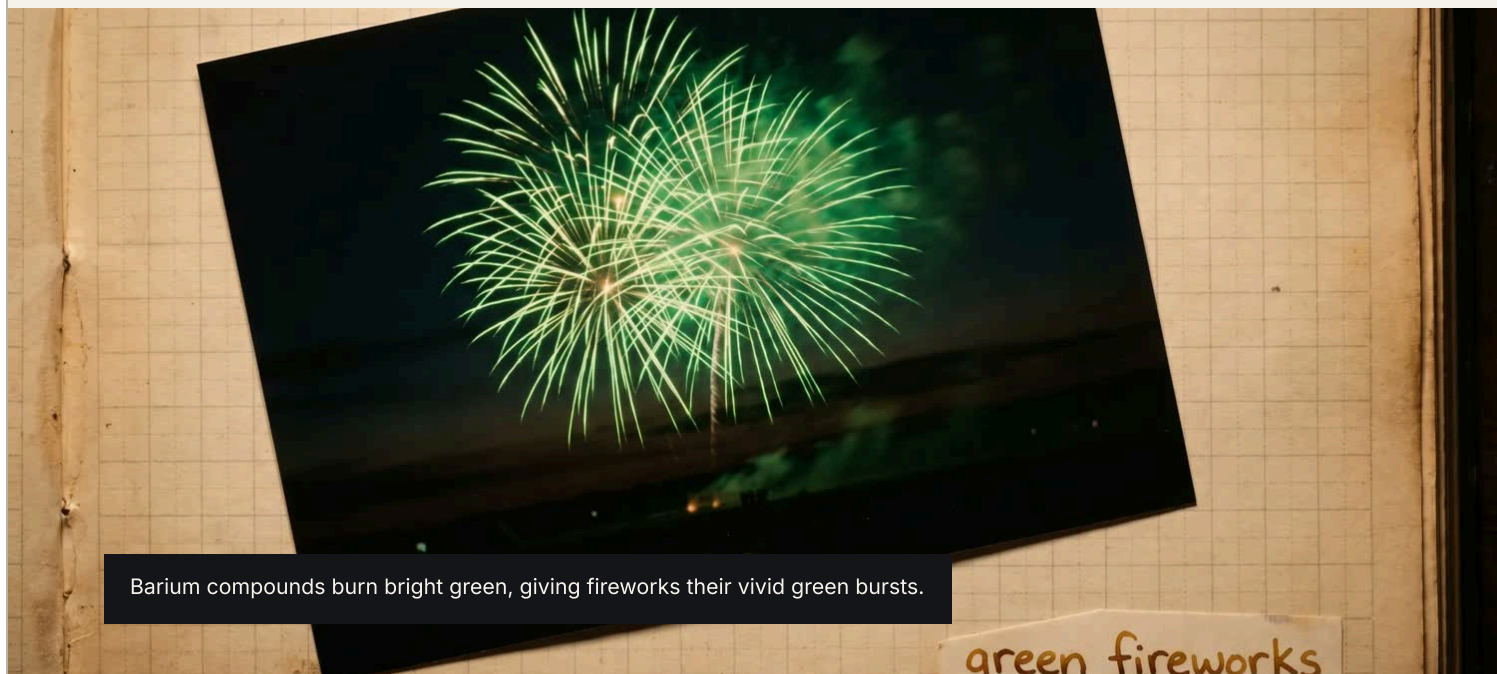
CHARGE

+2



DANGER

2/5 Caution



Barium compounds burn bright green, giving fireworks their vivid green bursts.



La

LANTHANUM

KICKS OFF THE LANTHANIDE ROW

MASS

138.91

ELECTRONS

[Xe] 5d¹ 6s²

BOILS

3464 °C

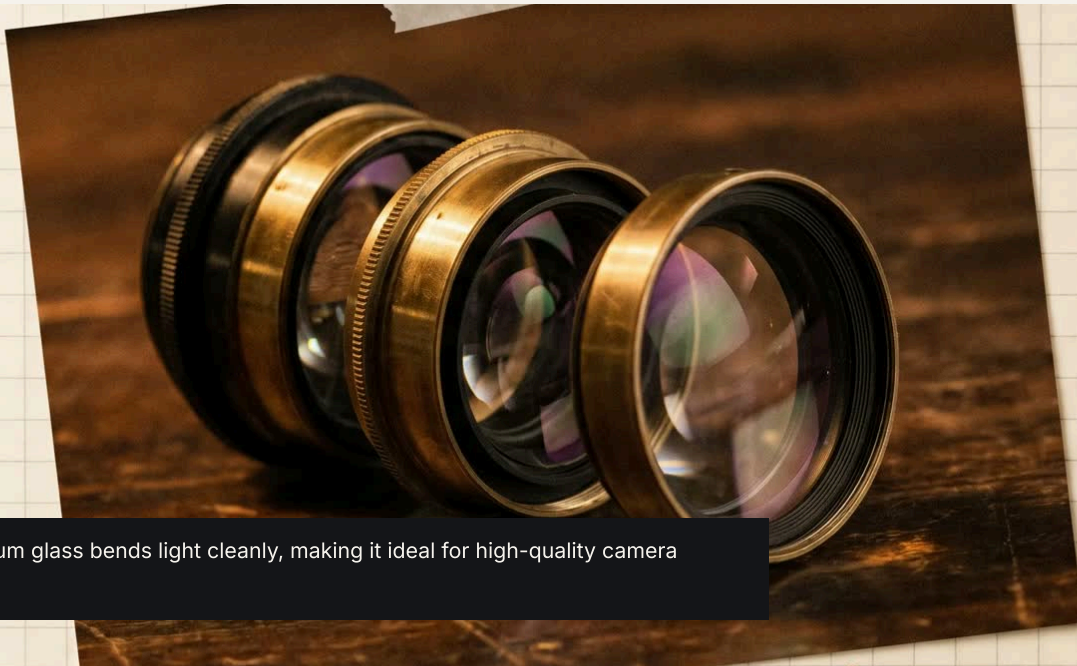
CHARGE

+3



DANGER

1/5 Low risk

A photograph of a disassembled camera lens with its various glass elements and metal housing parts laid out on a piece of graph paper. The lens components are arranged in a line, showing the internal structure of the lens.

Lanthanum glass bends light cleanly, making it ideal for high-quality camera lenses.



Ce

CERIUM

THE FLINT IN EVERY CIGARETTE LIGHTER

MASS

140.12

ELECTRONS

 $[\text{Xe}] 4f^1 5d^1 6s^2$

BOILS

3443 °C

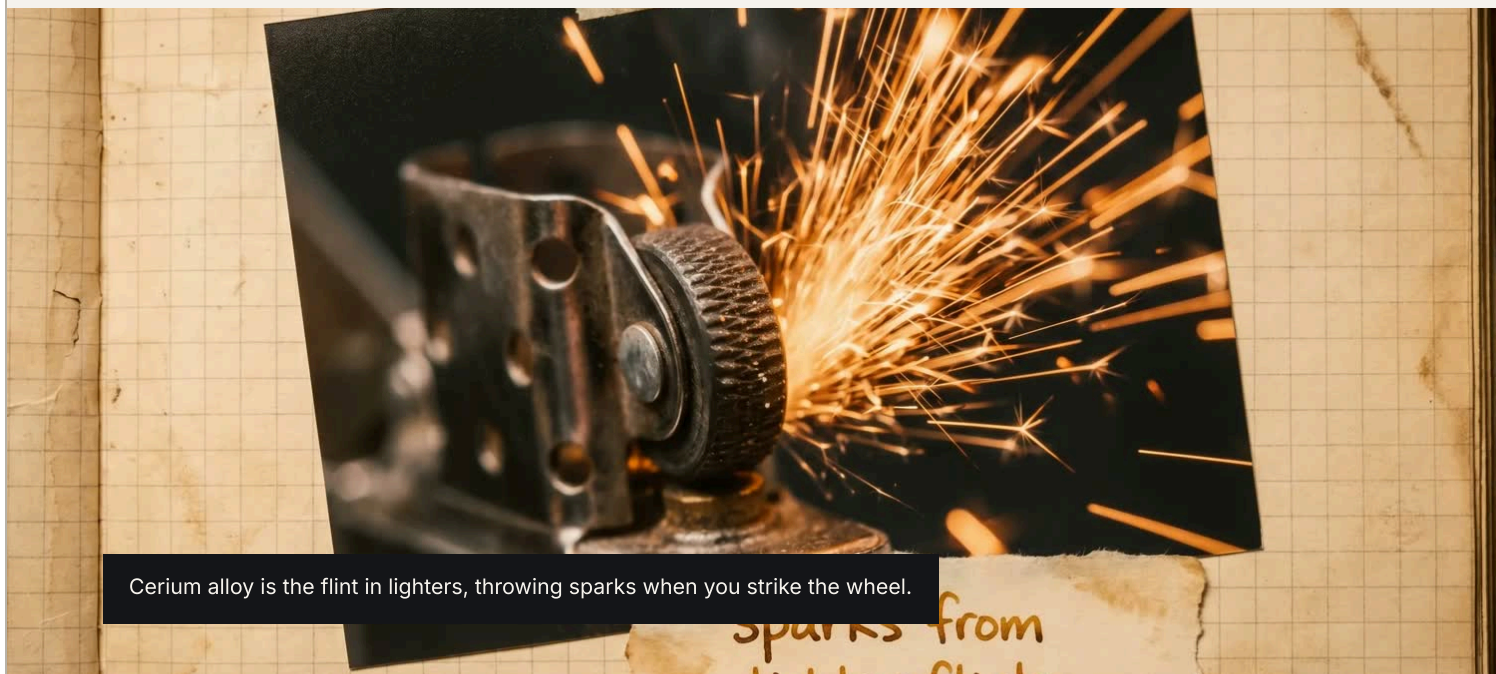
CHARGE

+3



DANGER

2/5 Caution



Cerium alloy is the flint in lighters, throwing sparks when you strike the wheel.



Pr

PRASEODYMIUM

THE GREEN FILTER IN WELDER'S GOGGLES

MASS
140.91

ELECTRONS
[Xe] 4f³ 6s²

BOILS
3520 °C

CHARGE
+3



DANGER
1/5 Low risk



Praseodymium tints the yellow glass in welding goggles that shields the eyes.

yellow
welding goggles



Nd

NEODYMIUM

NDFeB MAGNETS - THE STRONGEST PERMANENT MAGNETS EVER MADE

MASS
144.24

ELECTRONS
[Xe] 4f⁴ 6s²

BOILS
3074 °C

CHARGE
+3



DANGER
1/5 Low risk



Neodymium makes the strongest permanent magnets, found in headphones and motors.

the strongest



Pm

PROMETHIUM

NO STABLE ISOTOPES - VANISHINGLY RARE ON EARTH

MASS

[145]

ELECTRONS

[Xe] 4f⁵ 6s²

BOILS

3000 °C

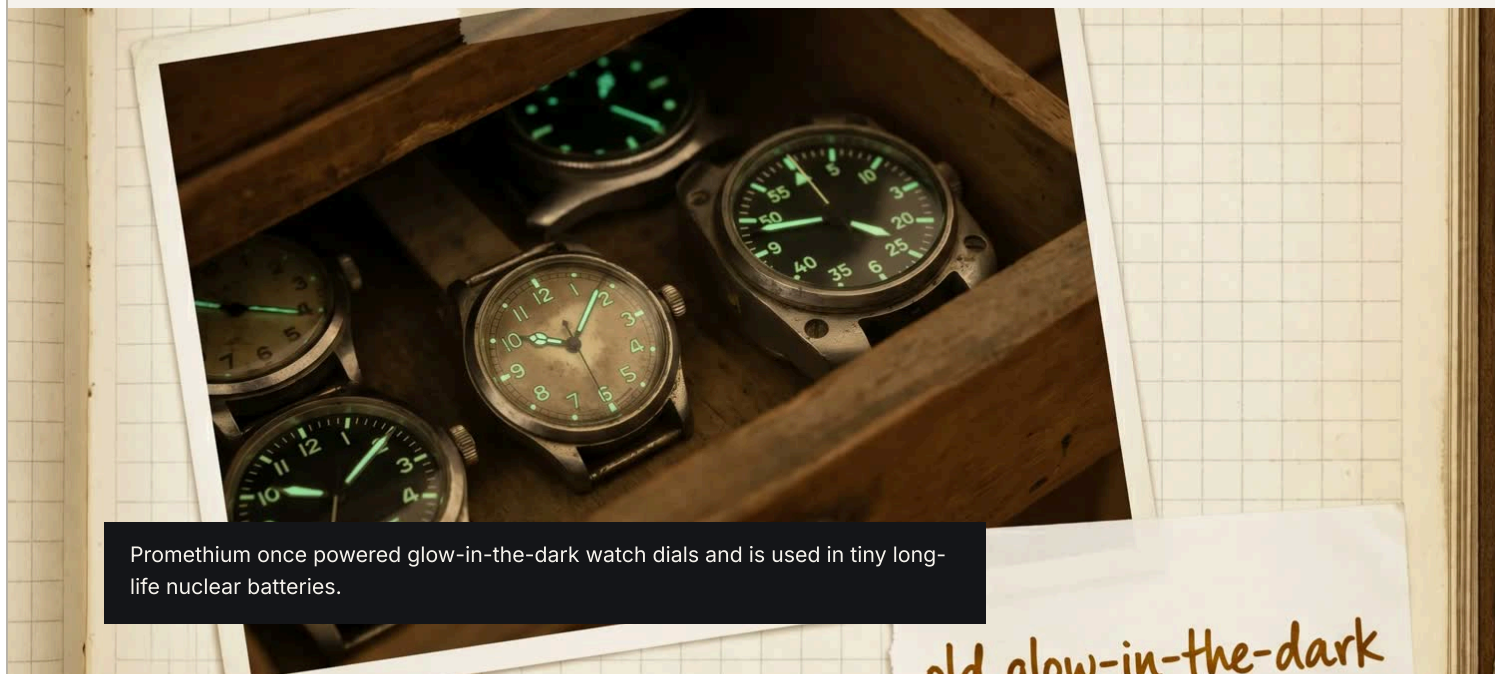
CHARGE

+3



DANGER

4/5 Severe



Promethium once powered glow-in-the-dark watch dials and is used in tiny long-life nuclear batteries.

old glow-in-the-dark



Sm

SAMARIUM

SMCO MAGNETS WORK HOT WHERE NDFEB FAILS

MASS
150.36

ELECTRONS
[Xe] 4f⁶ 6s²

BOILS
1794 °C

CHARGE
+3



DANGER
1/5 Low risk



Samarium-cobalt magnets stay strong at high temperatures, so they run motors and precision devices.

high-temp



EU

EUROPIUM

THE RED PHOSPHOR IN OLD CRT TV TUBES

MASS
151.96

ELECTRONS
[Xe] 4f⁷ 6s²

BOILS
1529 °C

CHARGE
+3



DANGER
2/5 Caution

Europium phosphors make the red and blue glow in TV and phone screens - and secure euro banknotes.

red/blue screen



Gd

GADOLINIUM

MRI CONTRAST AGENT - Gd^{3+} 'S SEVEN UNPAIRED F-ELECTRONS MAKE IT MAGNETICALLY LOUD

MASS

157.25

ELECTRONS

 $[Xe] 4f^7 5d^1 6s^2$

BOILS

3273 °C

CHARGE

+3



DANGER

1/5 Low risk



A gadolinium solution injected before an MRI makes certain tissues stand out clearly in the scan.

MRI contrast agent



Tb

TERBIUM

GREEN PHOSPHOR IN FLUORESCENT LAMPS AND TRICHROMATIC LEDS

MASS
158.93

ELECTRONS
[Xe] 4f⁹ 6s²

BOILS
3230 °C

CHARGE
+3



DANGER
1/5 Low risk



Terbium is the green phosphor in fluorescent lamps and many color displays.

green display



DY

DYSPROSIUM

HARD DRIVE HEADS, WIND TURBINE MAGNETS, ELECTRIC VEHICLE MOTORS

MASS

162.5

ELECTRONS

[Xe] 4f¹⁰ 6s²

BOILS

2567 °C

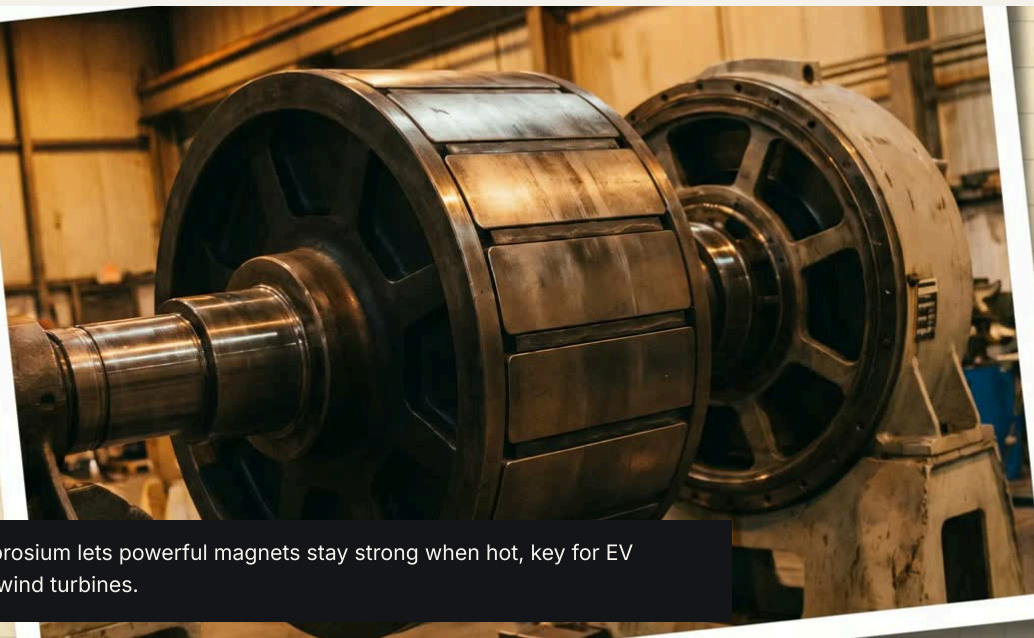
CHARGE

+3



DANGER

1/5 Low risk



Adding dysprosium lets powerful magnets stay strong when hot, key for EV motors and wind turbines.



Ho

HOLMIUM

THE HO:YAG LASER VAPORIZES KIDNEY STONES AND PROSTATE TISSUE

MASS
164.93

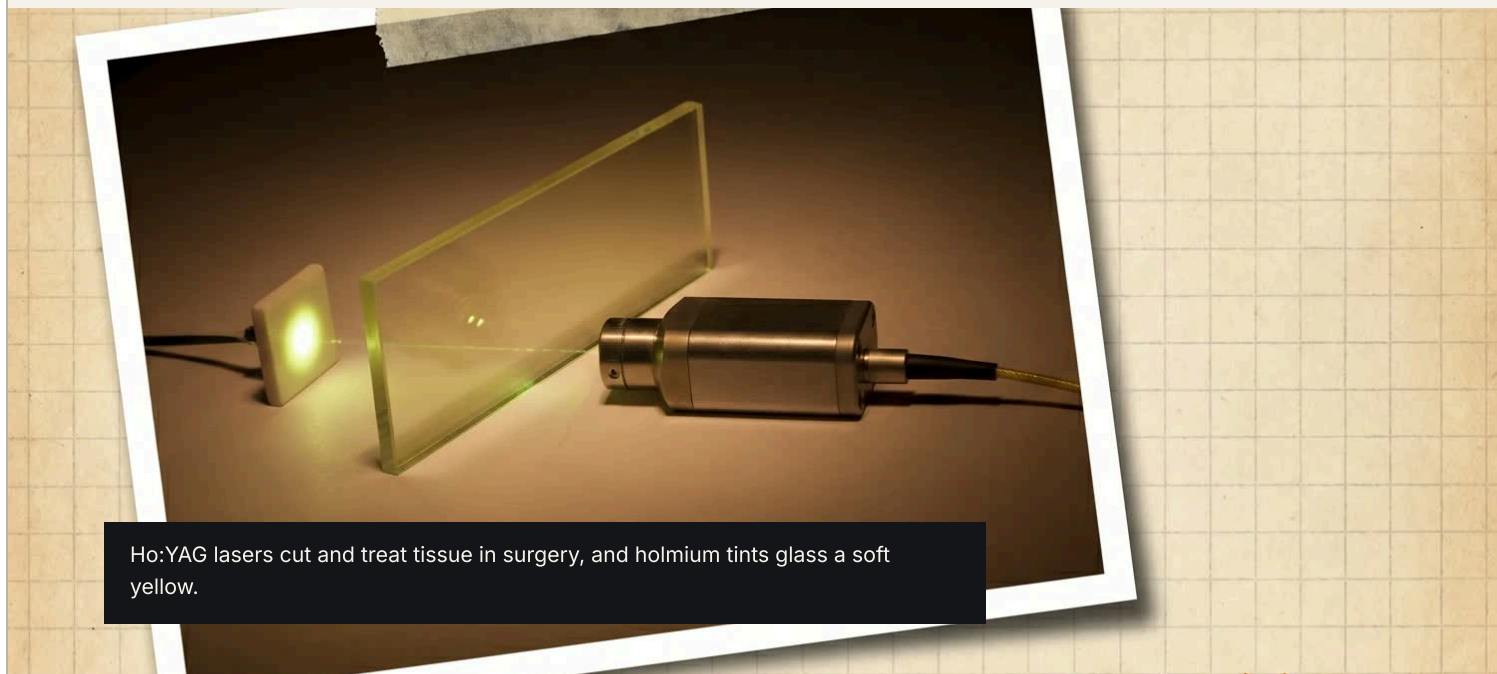
ELECTRONS
[Xe] 4f¹¹ 6s²

BOILS
2600 °C

CHARGE
+3



DANGER
1/5 Low risk



Ho:YAG lasers cut and treat tissue in surgery, and holmium tints glass a soft yellow.



Er

ERBIUM

ERBIUM-DOPED FIBER AMPLIFIERS (EDFAS) CARRY THE ENTIRE INTERNET ACROSS OCEANS

MASS

167.26

ELECTRONS

 $[\text{Xe}] 4f^{12} 6s^2$

BOILS

2868 °C

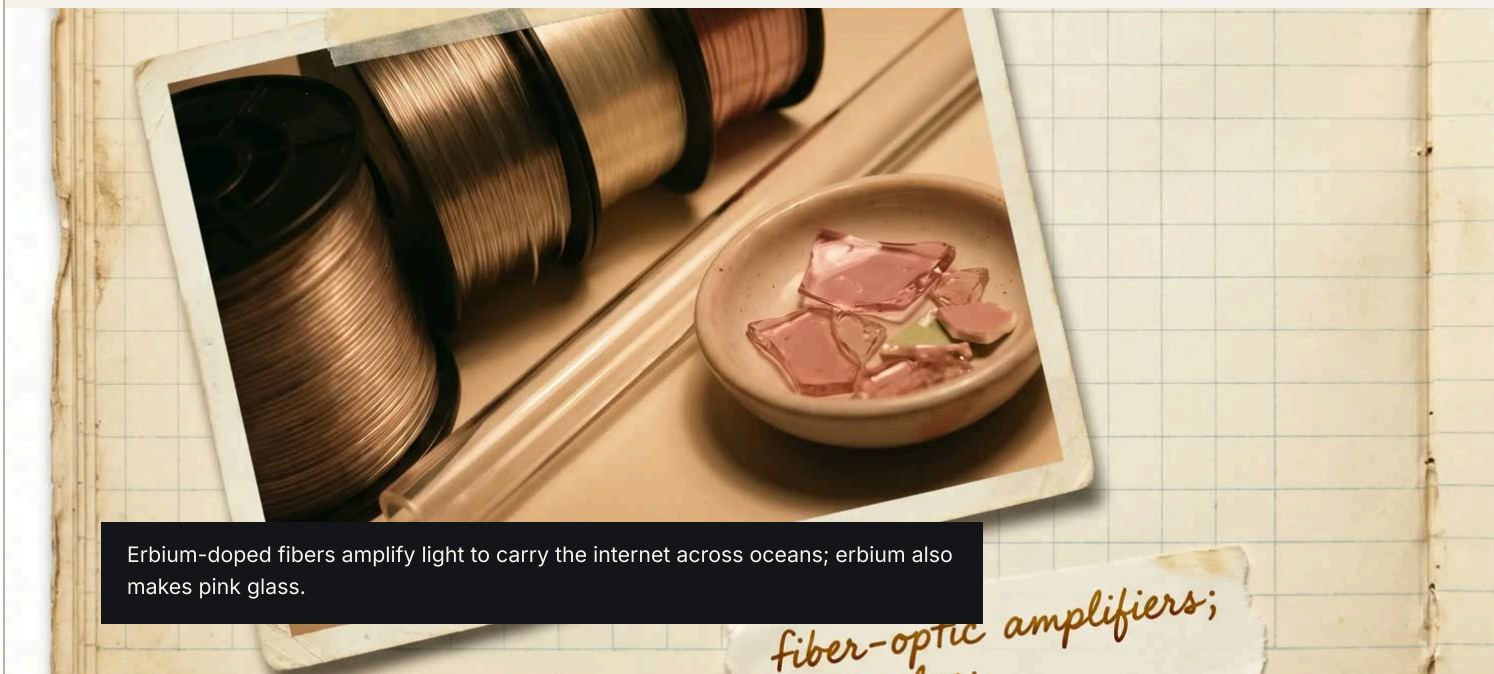
CHARGE

+3



DANGER

1/5 Low risk



Erbium-doped fibers amplify light to carry the internet across oceans; erbium also makes pink glass.

fiber-optic amplifiers;



Tm

THULIUM

PORTABLE X-RAY SOURCES FOR INDUSTRIAL AND MEDICAL IMAGING

MASS
168.93

ELECTRONS
[Xe] 4f¹³ 6s²

BOILS
1950 °C

CHARGE
+3



DANGER
1/5 Low risk



A thulium isotope powers small portable X-ray machines used far from hospitals.

portable X-ray



Yb

YTTERBIUM

YTTERBIUM ATOMIC CLOCKS BEAT CESIUM FOR PRECISION

MASS
173.05

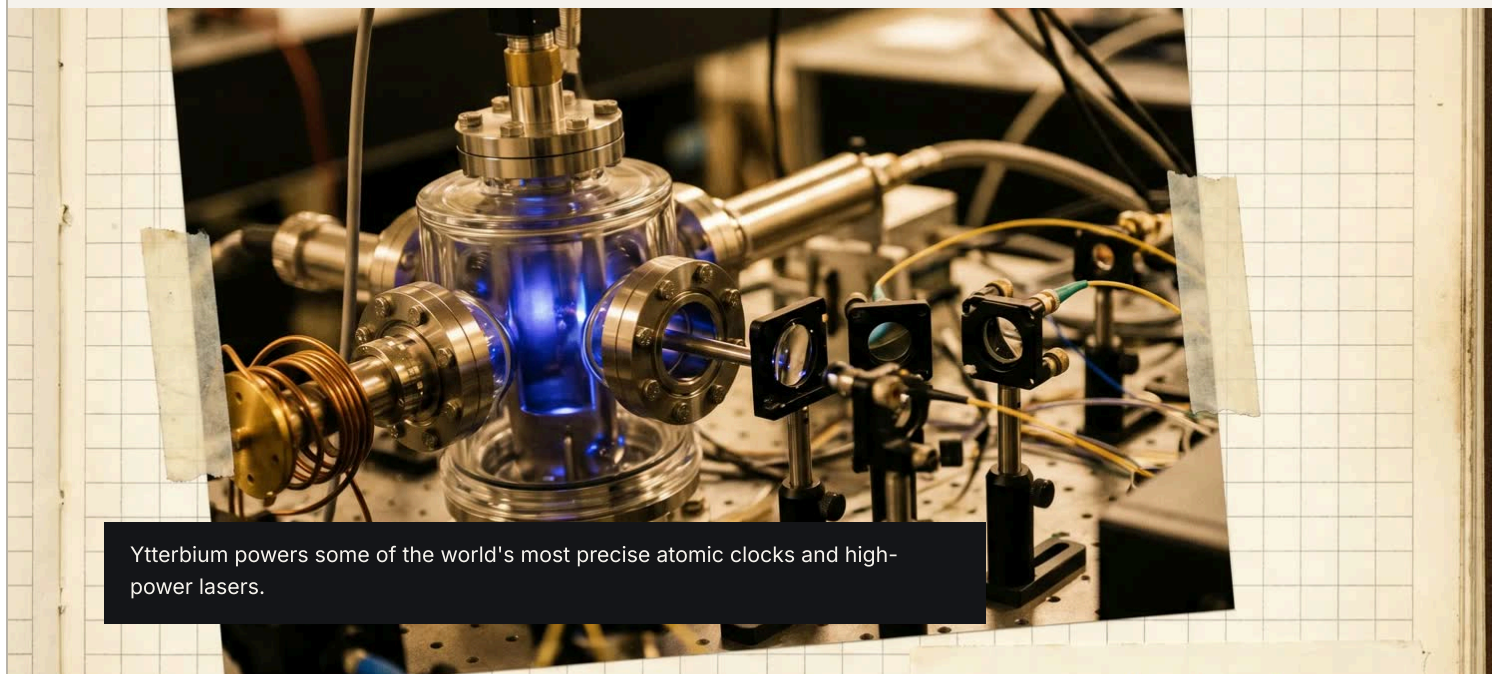
ELECTRONS
[Xe] 4f¹⁴ 6s²

BOILS
1196 °C

CHARGE
+3



DANGER
2/5 Caution



Ytterbium powers some of the world's most precise atomic clocks and high-power lasers.



Lu

LUTETIUM

LAST LANTHANIDE, HARDEST TO ISOLATE

MASS

174.97

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^1 6s^2$

BOILS

3402 °C

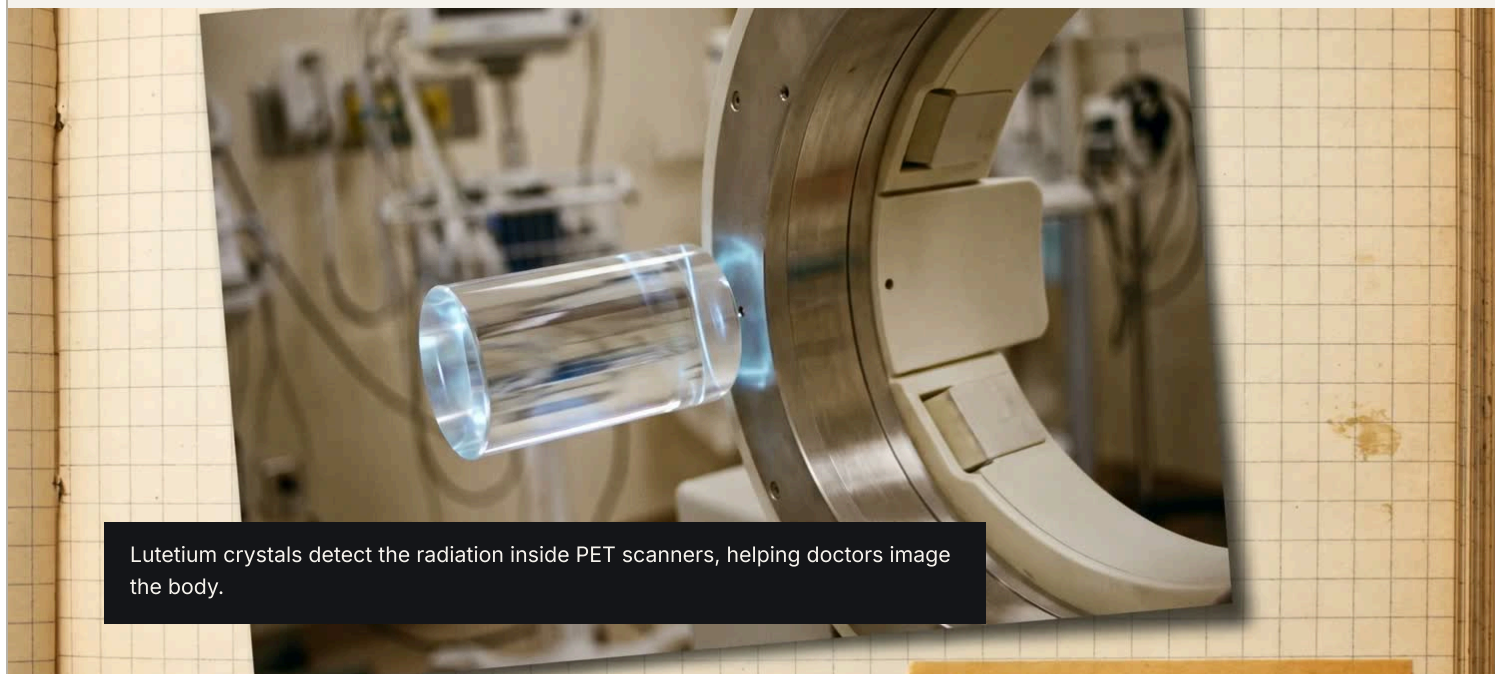
CHARGE

+3



DANGER

1/5 Low risk



Lutetium crystals detect the radiation inside PET scanners, helping doctors image the body.



Hf

HAFNIUM

NUCLEAR-REACTOR CONTROL RODS (HIGH NEUTRON-CAPTURE CROSS-SECTION)

MASS

178.49

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^2 6s^2$

BOILS

4603 °C

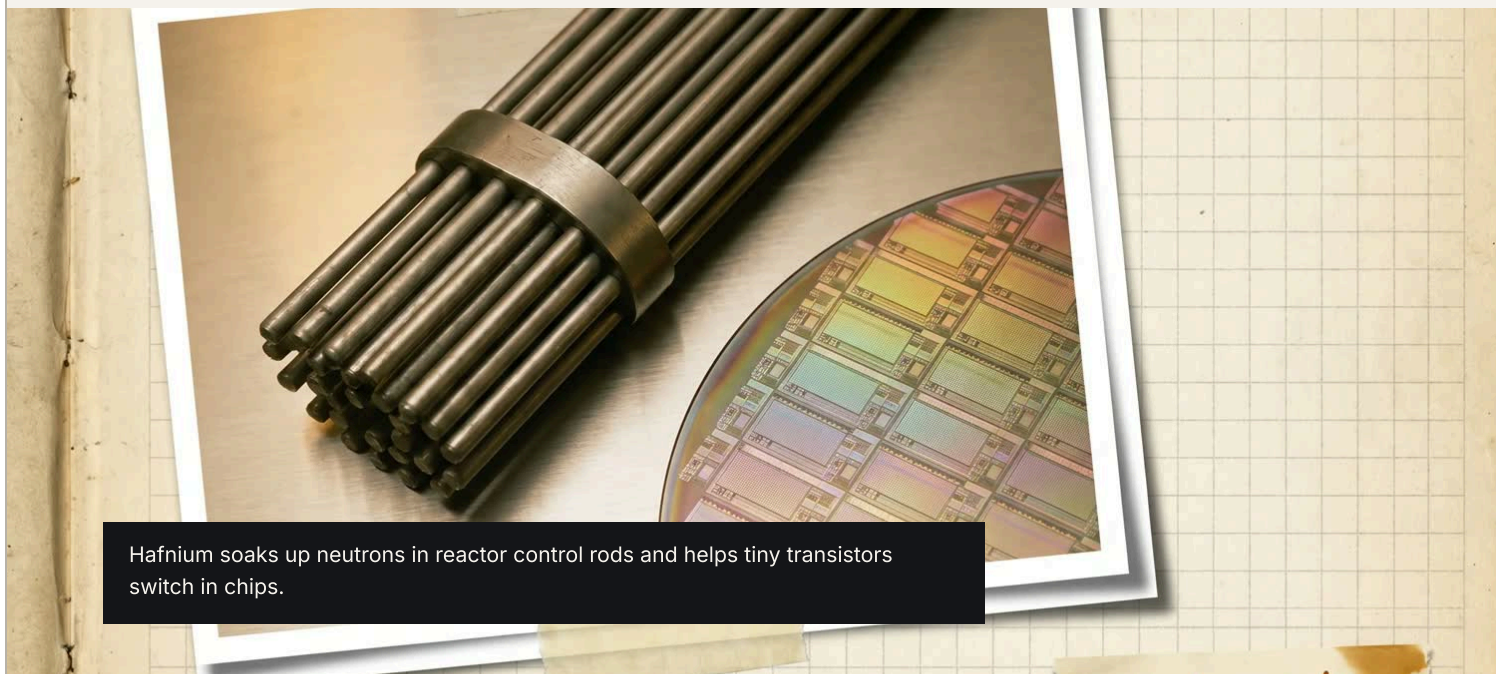
CHARGE

+4



DANGER

1/5 Low risk



Hafnium soaks up neutrons in reactor control rods and helps tiny transistors switch in chips.



Ta

TANTALUM

CAPACITORS IN EVERY SMARTPHONE (TA₂O₅ DIELECTRIC)

MASS

180.95

ELECTRONS

[Xe] 4f¹⁴ 5d³ 6s²

BOILS

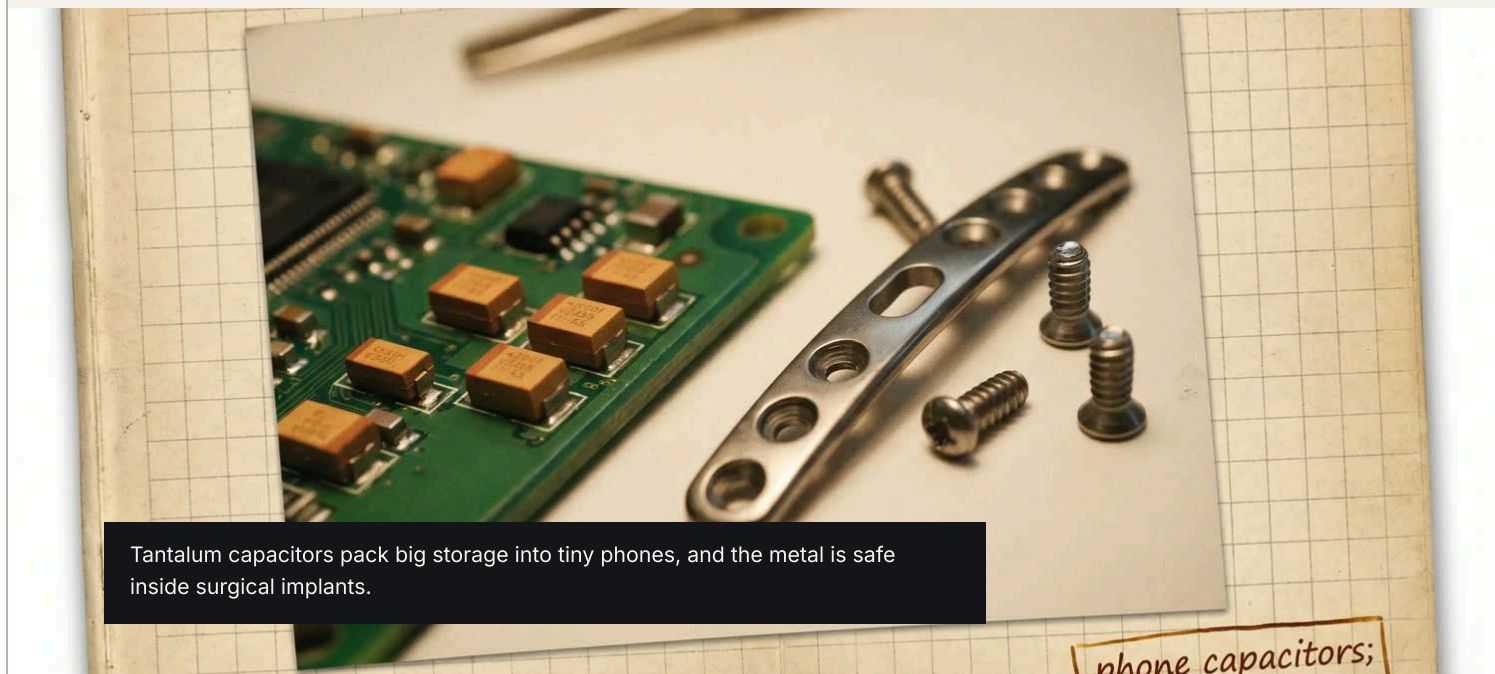
5458 °C

CHARGE

+5

DANGER

0/5 Safe to handle



Tantalum capacitors pack big storage into tiny phones, and the metal is safe inside surgical implants.

phone capacitors;



W

TUNGSTEN

HIGHEST MELTING POINT OF ANY ELEMENT (3422°C)

MASS

183.84

ELECTRONS

 $[Xe] 4f^{14} 5d^4 6s^2$

BOILS

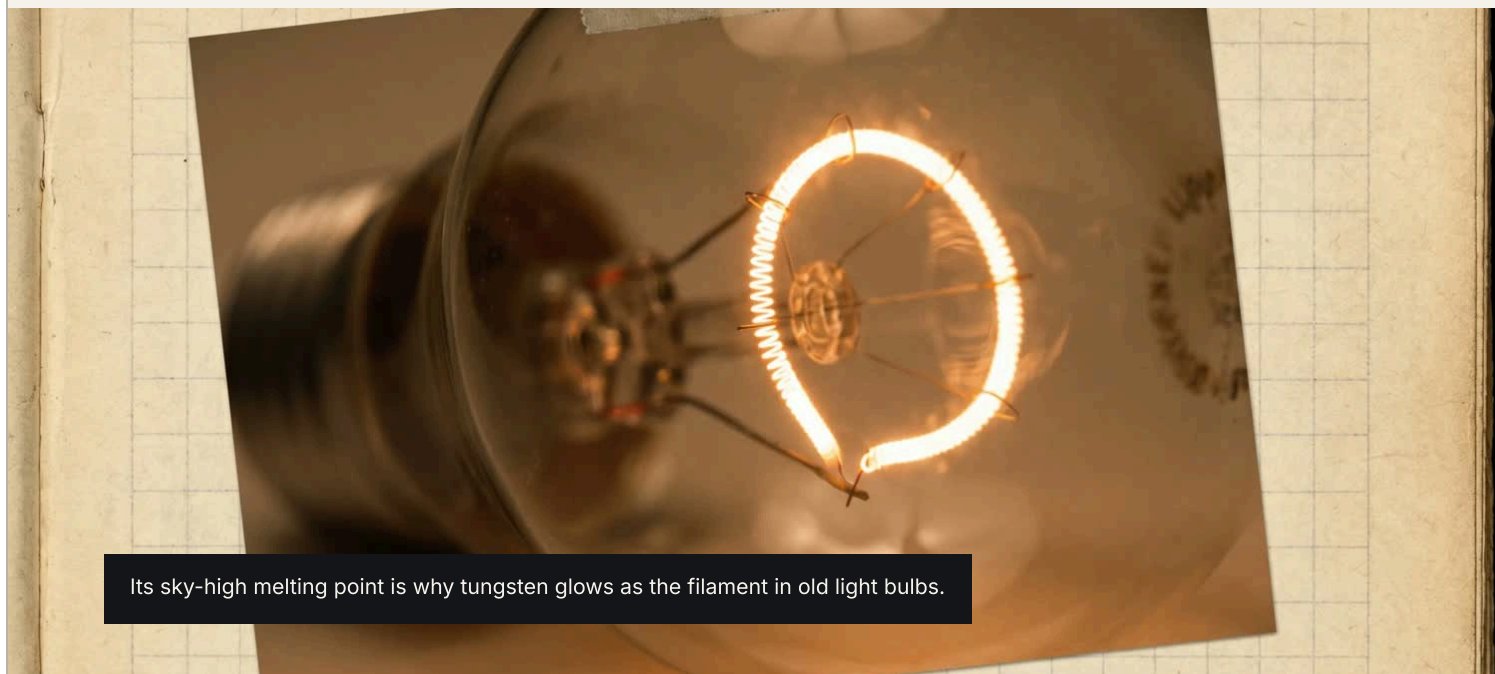
5930 °C

CHARGE

+4, +6

DANGER

0/5 Safe to handle



Its sky-high melting point is why tungsten glows as the filament in old light bulbs.



Re

RHENIUM

JET-ENGINE TURBINE BLADES - RE SUPERALLOYS SURVIVE HIGHER TEMPERATURES THAN ANY OTHERS

MASS

186.21

ELECTRONS

 $[Xe] 4f^{14} 5d^5 6s^2$

BOILS

5596 °C

CHARGE

+4, +7



DANGER

1/5 Low risk



Rhenium goes into the superalloys of jet-engine turbine blades, where metals must survive blistering heat.

*jet-engine
alloys*



Os

OSMIUM

DENSEST STABLE ELEMENT (22.59 G/CM³)

MASS
190.23

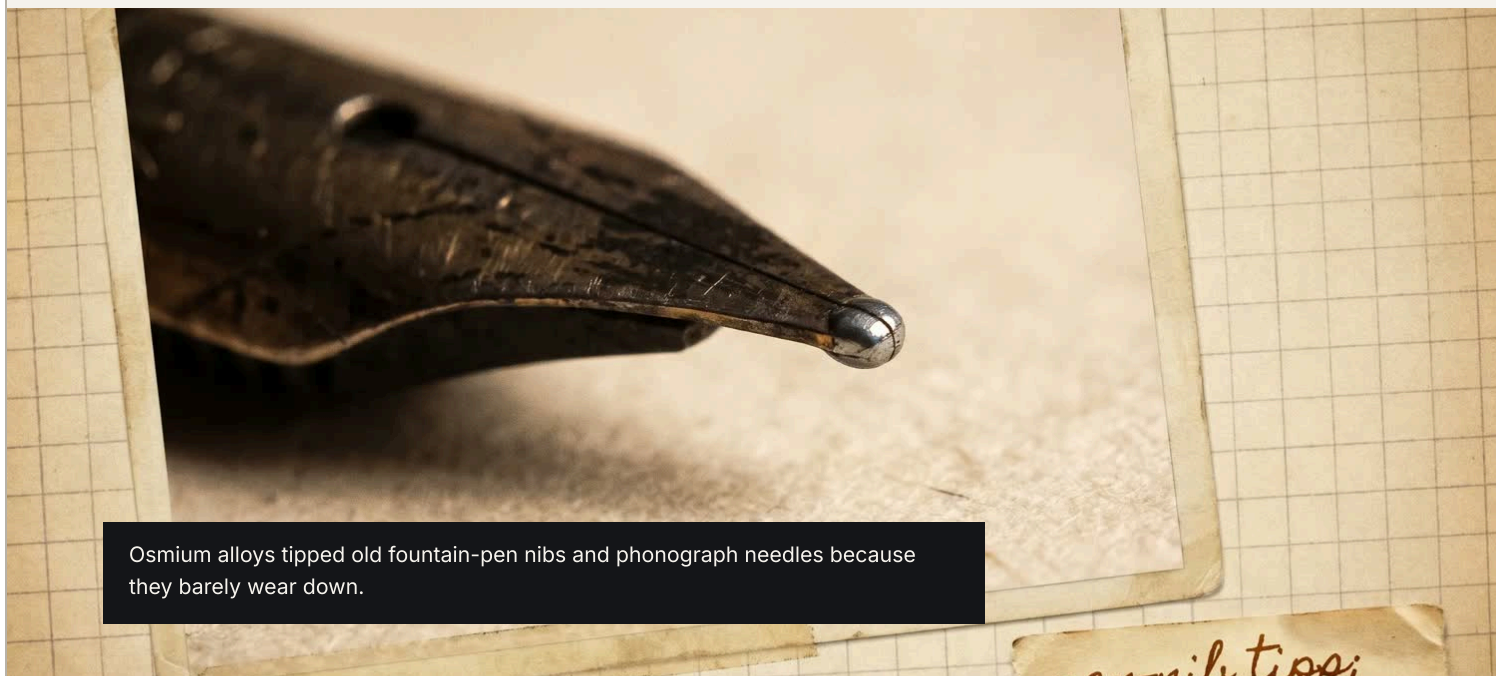
ELECTRONS
[Xe] 4f¹⁴ 5d⁶ 6s²

BOILS
5012 °C

CHARGE
+4, +8



DANGER
3/5 Hazardous



Osmium alloys tipped old fountain-pen nibs and phonograph needles because they barely wear down.



Ir

IRIDIUM

THE IRIDIUM-RICH CRETACEOUS-PALEOGENE BOUNDARY LAYER
MARKS THE DINOSAUR-KILLING ASTEROID

MASS

192.22

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^7 6s^2$

BOILS

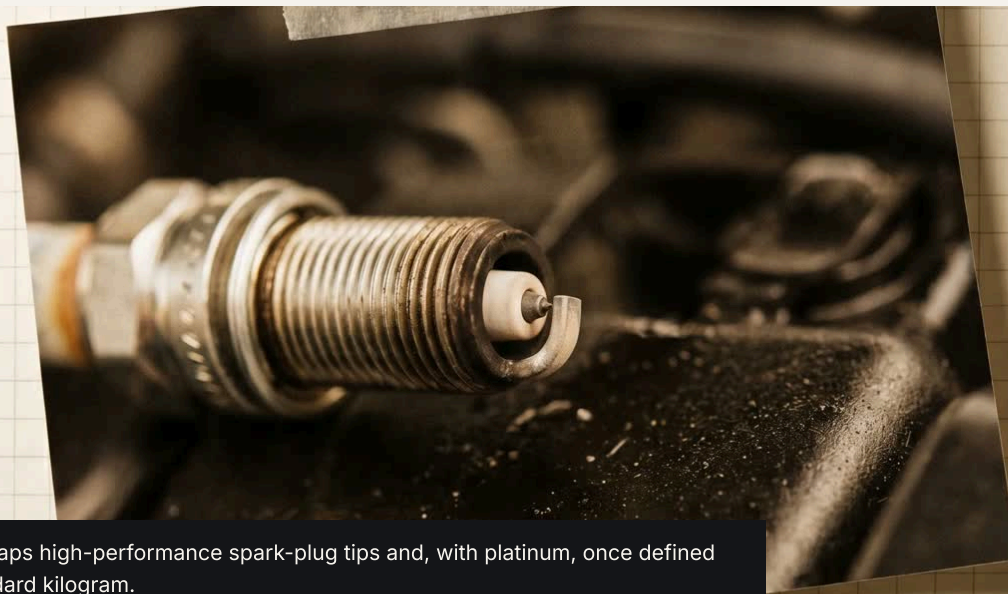
4428 °C

CHARGE

+3, +4

DANGER

0/5 Safe to handle



Iridium caps high-performance spark-plug tips and, with platinum, once defined the standard kilogram.



Pt

PLATINUM

CATALYTIC CONVERTERS

MASS

195.08

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^9 6s^1$

BOILS

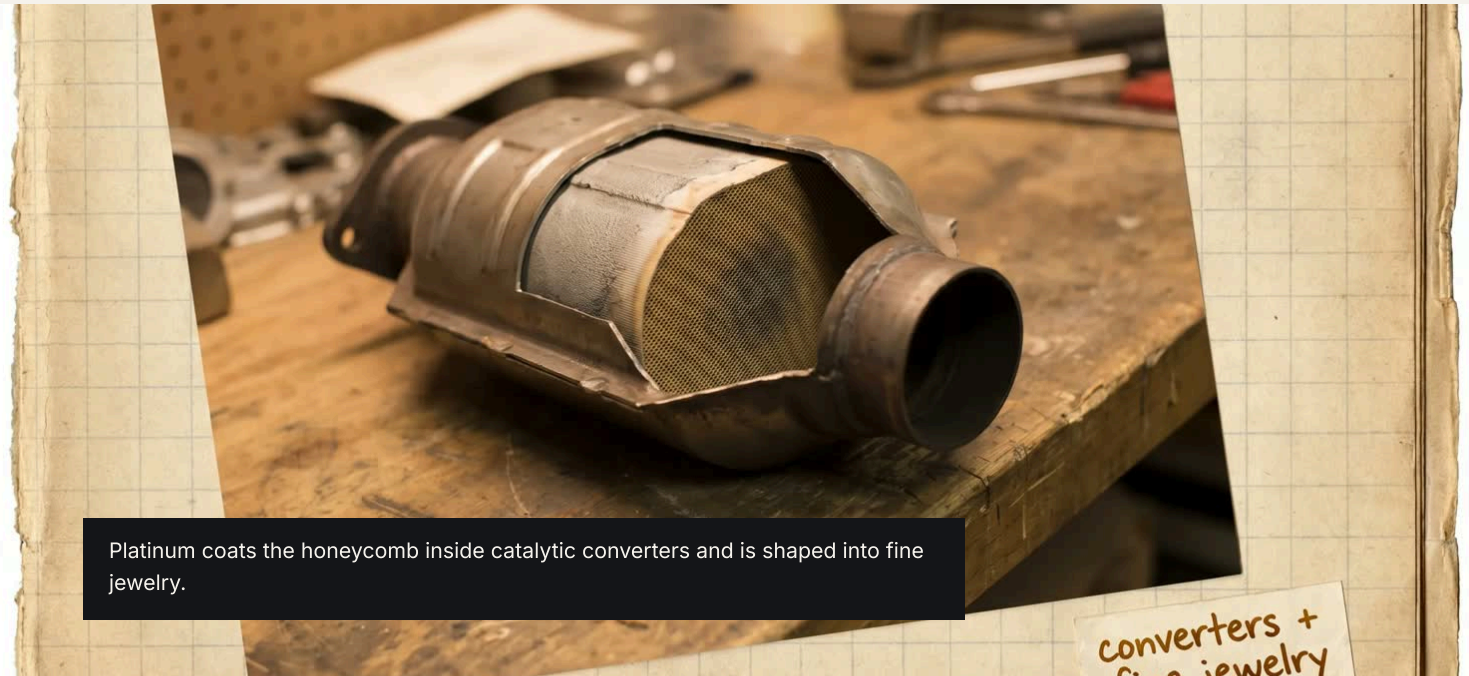
3825 °C

CHARGE

+2, +4

DANGER

0/5 Safe to handle



Platinum coats the honeycomb inside catalytic converters and is shaped into fine jewelry.

converters +
jewelry



AU

GOLD

SOFT, DENSE, ALMOST CHEMICALLY INERT AT ROOM TEMPERATURE

MASS

196.97

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^{10} 6s^1$

BOILS

2856 °C

CHARGE

+1, +3

DANGER

0/5 Safe to handle



Because it barely reacts, gold jewelry keeps its shine for centuries.

jewellery that



Hg

MERCURY

THE ONLY METAL LIQUID AT ROOM TEMPERATURE

MASS

200.59

ELECTRONS

[Xe] 4f¹⁴ 5d¹⁰ 6s²

BOILS

357 °C

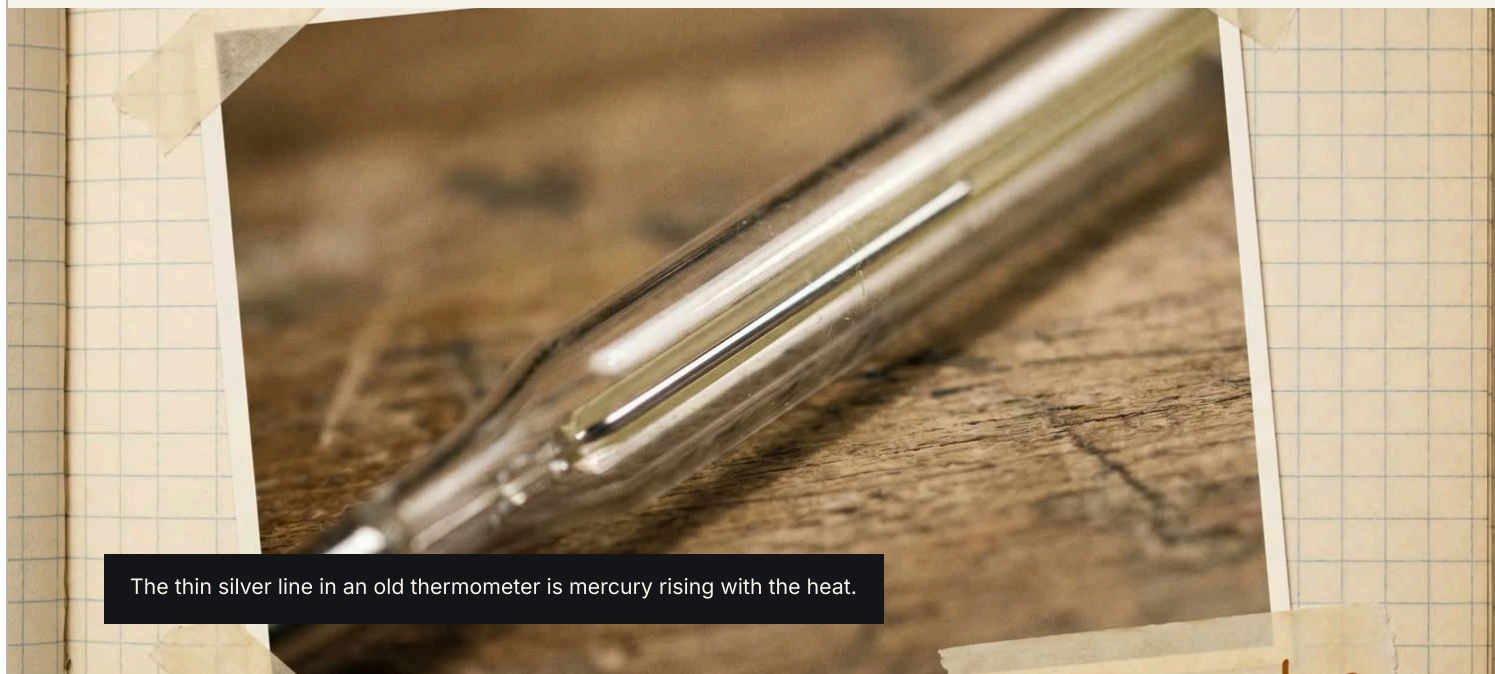
CHARGE

+1, +2

DANGER



3/5 Hazardous



The thin silver line in an old thermometer is mercury rising with the heat.



Tl

THALLIUM

THE “POISONER’S POISON” - ODORLESS, TASTELESS, LETHAL

MASS

204.38

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^{10} 6s^2 6p^1$

BOILS

1473 °C

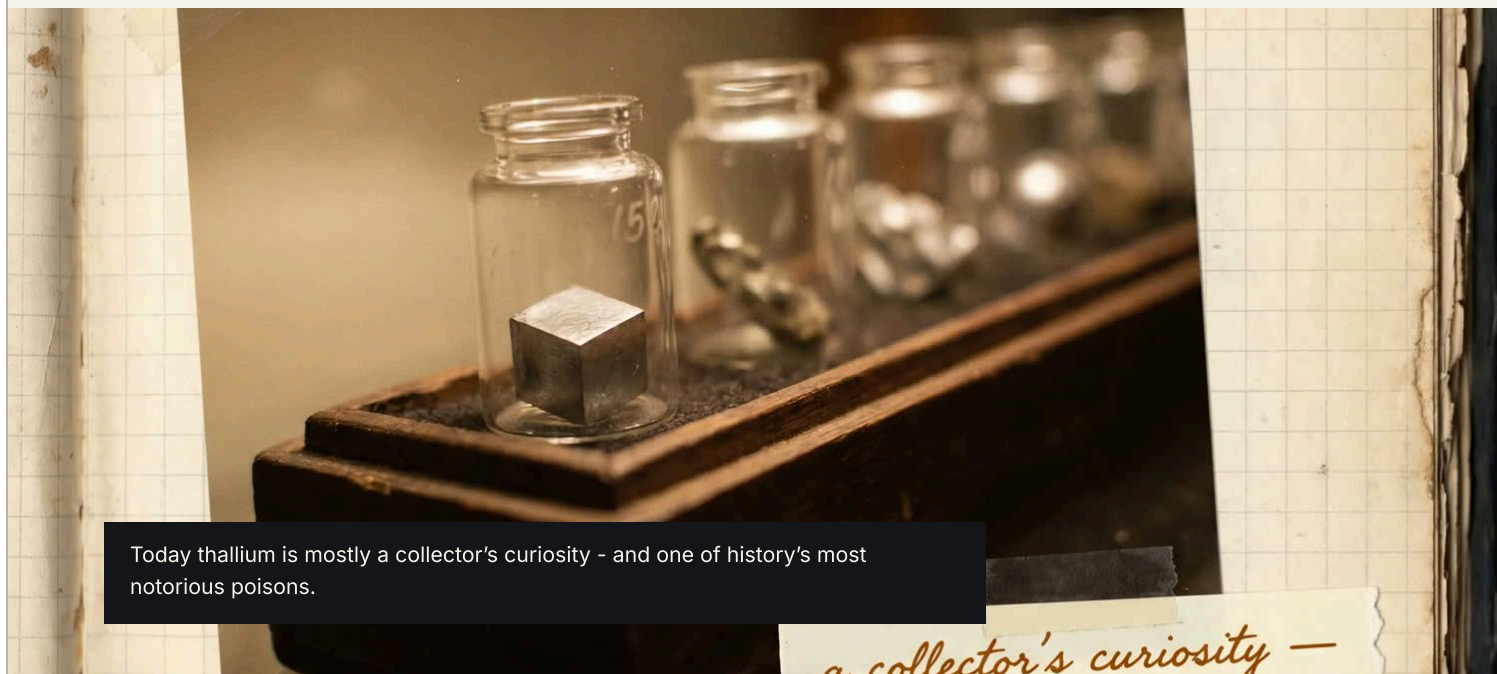
CHARGE

+1, +3



DANGER

4/5 Severe



Today thallium is mostly a collector's curiosity - and one of history's most notorious poisons.

a collector's curiosity —



Pb

LEAD

DENSE, SOFT, TOXIC

MASS

207.2

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^{10} 6s^2 6p^2$

BOILS

1749 °C

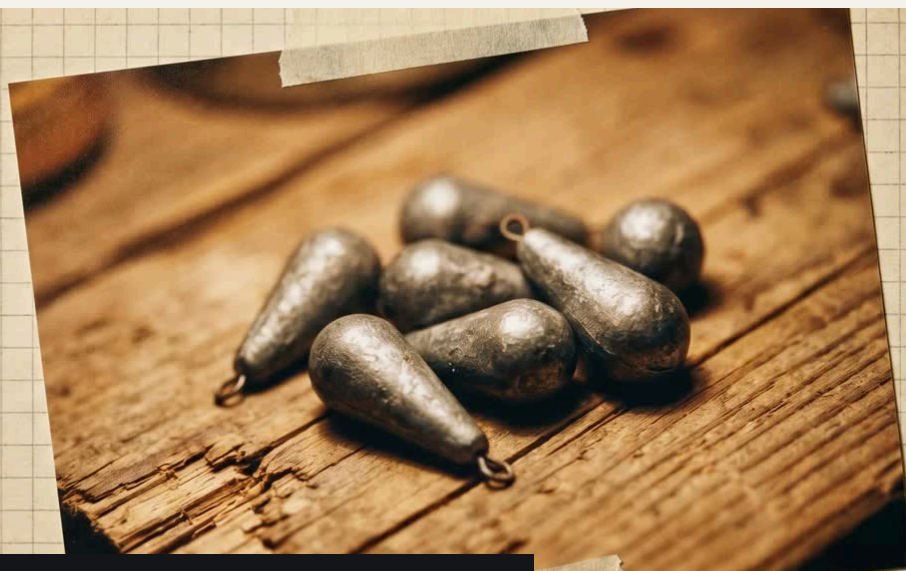
CHARGE

+2, +4

DANGER



3/5 Hazardous



Lead's density makes it ideal for fishing sinkers and car batteries.

fishing sinkers,



Bi

BISMUTH

PEPTO-BISMOL (BISMUTH SUBSALICYLATE) COATS YOUR STOMACH
PINK

MASS

208.98

ELECTRONS

 $[\text{Xe}] 4f^{14} 5d^{10} 6s^2 6p^3$

BOILS

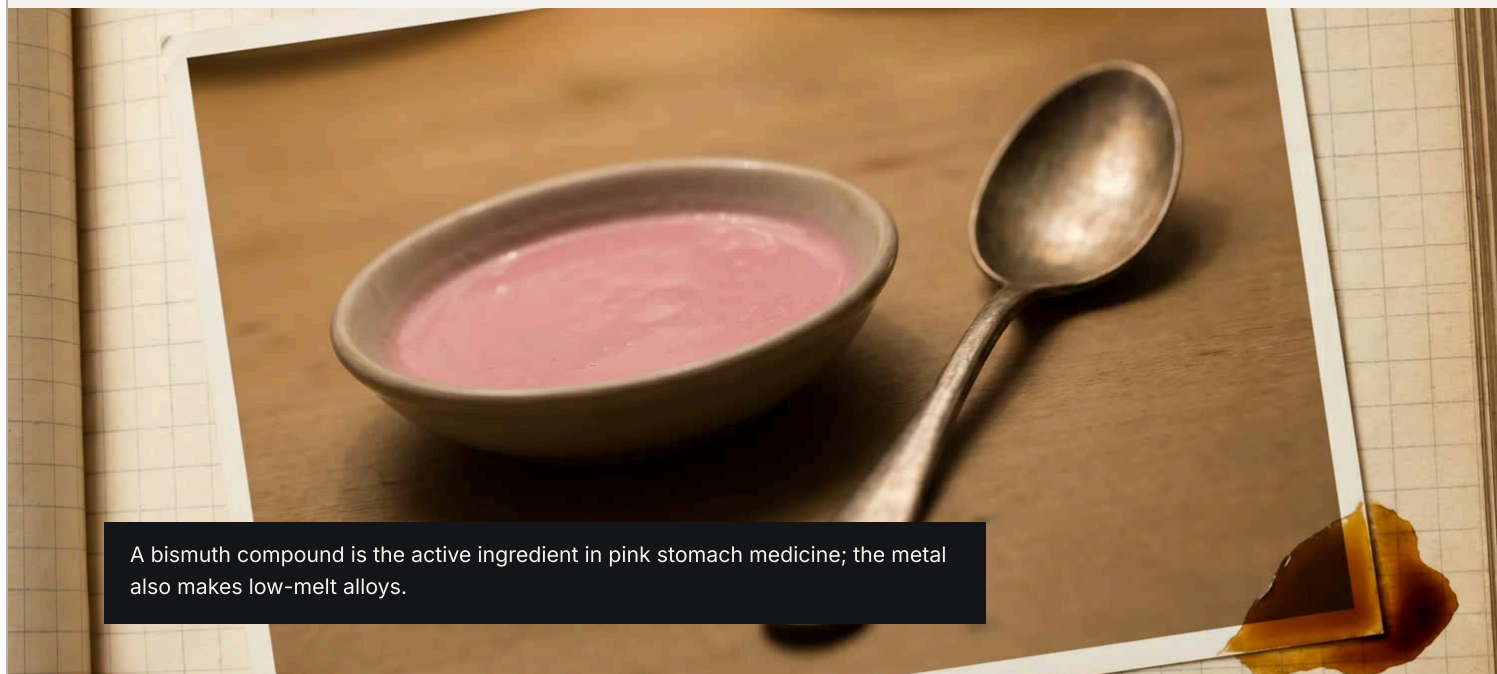
1564 °C

CHARGE

+3, +5

DANGER

0/5 Safe to handle



A bismuth compound is the active ingredient in pink stomach medicine; the metal also makes low-melt alloys.



PO

POLONIUM

MARIE CURIE'S FIRST NEW ELEMENT, NAMED FOR HER OCCUPIED HOMELAND

MASS
[209]

ELECTRONS
[Xe] 4f¹⁴ 5d¹⁰ 6s² 6p⁴

BOILS
962 °C

CHARGE
-2, +2, +4



DANGER
5/5 Extreme

Why no photograph? Polonium is intensely radioactive and exists only in tiny traces. The pure metal has been made in minute, heavily shielded amounts - never anything you would encounter.



At

ASTATINE

THE RAREST NATURALLY-OCCURRING ELEMENT ON EARTH - LESS THAN 30 GRAMS IN THE ENTIRE CRUST AT ANY GIVEN MOMENT

MASS

[210]

ELECTRONS

[Xe] 4f¹⁴ 5d¹⁰ 6s² 6p⁵

BOILS

337 °C

CHARGE

-1, +1, +3, +5, +7



DANGER

5/5 Extreme

Why no photograph? Astatine is the rarest naturally occurring element. It is so radioactive that any visible amount would instantly boil away in its own heat - no one has ever seen it.



Rn

RADON

COLORLESS, ODORLESS, RADIOACTIVE GAS SEEPING OUT OF GRANITE

MASS
[222]

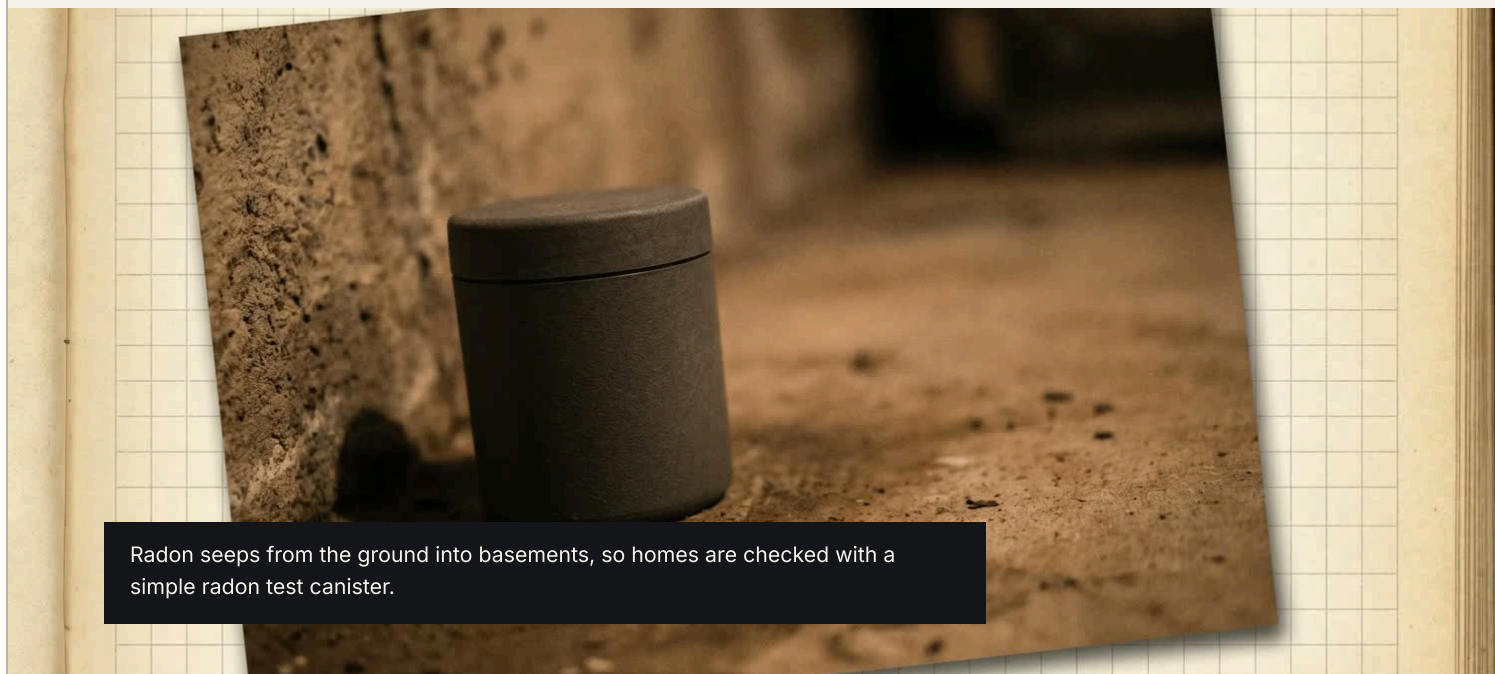
ELECTRONS
[Xe] 4f¹⁴ 5d¹⁰ 6s² 6p⁶

BOILS
-62 °C

CHARGE
0, +2



DANGER
4/5 Severe



Radon seeps from the ground into basements, so homes are checked with a simple radon test canister.



Fr

FRANCIUM

THE RAREST OF THE “NATURALLY-OCCURRING” ELEMENTS AFTER
ASTATINE

MASS

[223]

ELECTRONS

[Rn] 7s¹

BOILS

677 °C

CHARGE

+1



DANGER

5/5 Extreme

Why no photograph? Francium is wildly unstable: its longest-lived form lasts about 22 minutes. It exists only as a fleeting step in uranium's decay chain, so although new atoms keep forming in trace amounts, it has never been gathered into a visible piece.



Ra

RADIUM

MARIE CURIE'S GLOW-IN-THE-DARK ELEMENT

MASS
[226]

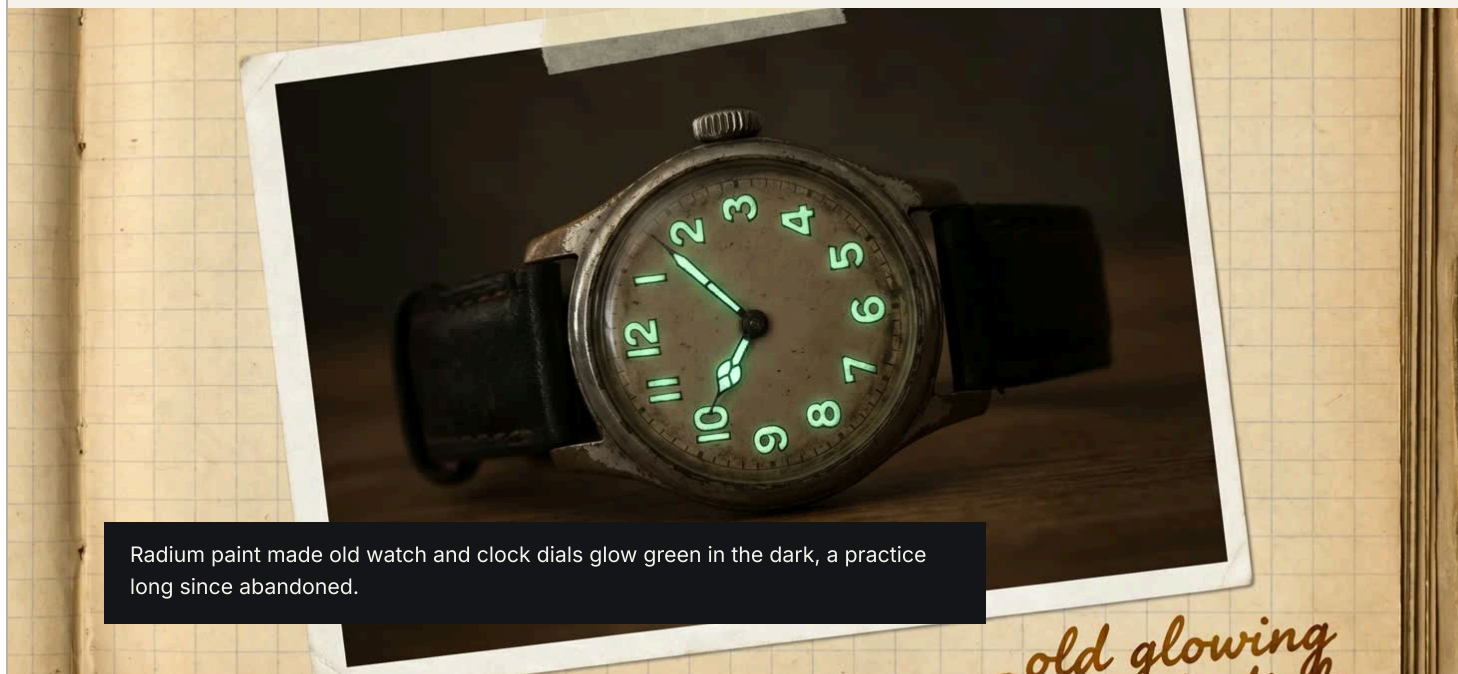
ELECTRONS
[Rn] 7s²

BOILS
1737 °C

CHARGE
+2



DANGER
5/5 Extreme



Radium paint made old watch and clock dials glow green in the dark, a practice long since abandoned.

old glowing



AC

ACTINIUM

GLOWS BLUE IN THE DARK FROM THE RADIATION IT EMITS

MASS

[227]

ELECTRONS

[Rn] 6d¹ 7s²

BOILS

3200 °C

CHARGE

+3



DANGER

5/5 Extreme

Why no photograph? Actinium is so radioactive it glows faintly blue in the dark. It exists only in tiny lab-made amounts and is never seen outside shielded research.



Th

THORIUM

POTENTIAL NEXT-GENERATION NUCLEAR FUEL - ABUNDANT, CAN'T WEAPONIZE EASILY

MASS
232.04

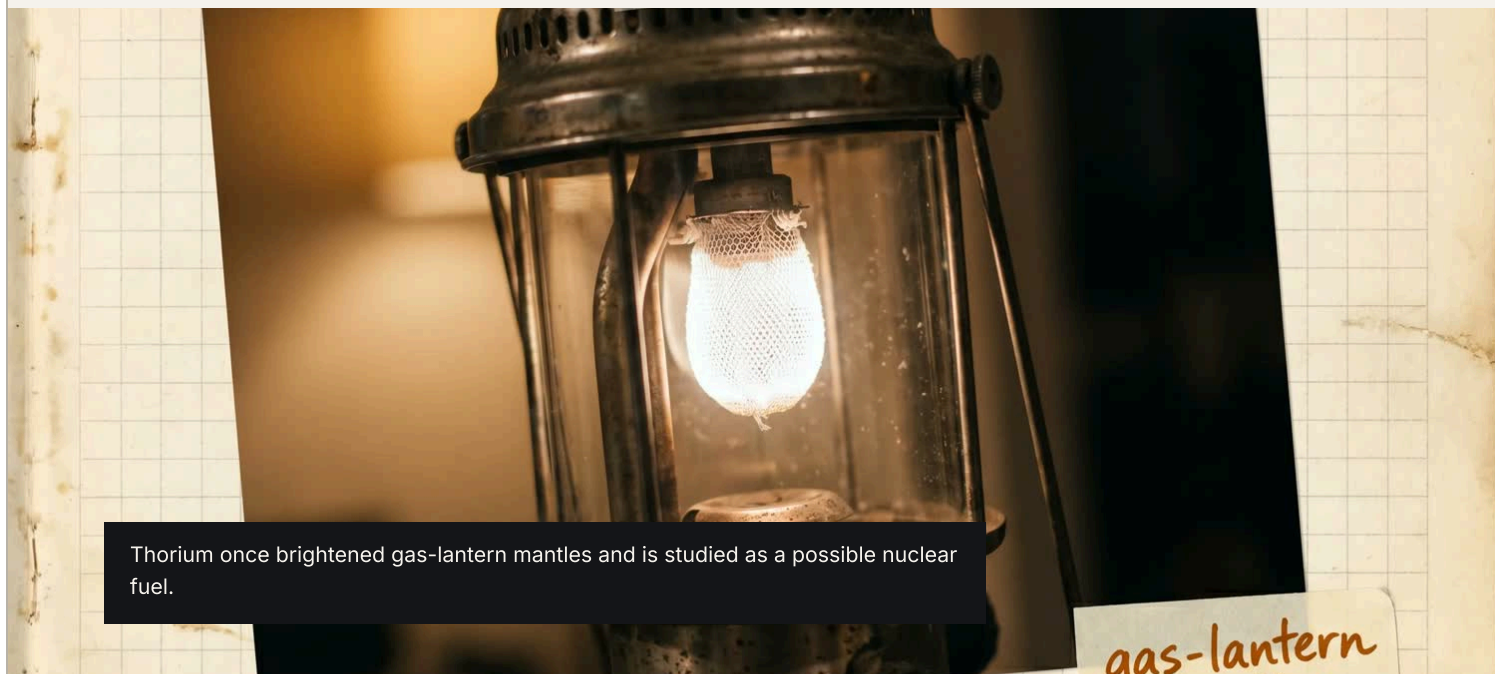
ELECTRONS
[Rn] 6d² 7s²

BOILS
4788 °C

CHARGE
+4



DANGER
3/5 Hazardous



Thorium once brightened gas-lantern mantles and is studied as a possible nuclear fuel.

gas-lantern



Pa

PROTACTINIUM

DECAYS INTO ACTINIUM - THAT IS THE ENTIRE REASON FOR ITS NAME

MASS

231.04

ELECTRONS

 $[Rn] 5f^2 6d^1 7s^2$

BOILS

4027 °C

CHARGE

+4, +5



DANGER

4/5 Severe

Why no photograph? Protactinium is one of the rarest and most radioactive natural elements - isolated only in tiny research quantities, never something you would meet.



U

URANIUM

HEAVIEST ELEMENT FOUND IN SIGNIFICANT AMOUNTS IN NATURE

MASS
238.03ELECTRONS
[Rn] 5f³ 6d¹ 7s²BOILS
4131 °CCHARGE
+3, +4, +5, +6DANGER
4/5 Severe

Uranium powers nuclear reactors, and trace uranium makes vintage glass glow green under UV light.

nuclear fuel;
uranium glass



Np

NEPTUNIUM

FIRST ELEMENT BEYOND URANIUM SYNTHESIZED (1940)

MASS
[237]

ELECTRONS
[Rn] 5f⁴ 6d¹ 7s²

BOILS
4000 °C

CHARGE
+3, +4, +5, +6, +7



DANGER
4/5 Severe

Why no photograph? Neptunium is synthetic, forged in nuclear reactors and handled only behind heavy shielding. It exists in real amounts, but never anywhere you would encounter it.



PU

PLUTONIUM

THE TRINITY TEST CORE

MASS
[244]

ELECTRONS
[Rn] 5f⁶ 7s²

BOILS
3228 °C

CHARGE
+3, +4, +5, +6



DANGER
5/5 Extreme

Why no photograph? Plutonium has been made by the ton for reactors and spacecraft power, and even photographed - but it is intensely radioactive and locked inside shielded facilities. You will never meet it.



Am

AMERICIUM

THE RADIOACTIVE ISOTOPE INSIDE EVERY HOUSEHOLD IONIZATION SMOKE DETECTOR

MASS

[243]

ELECTRONS

[Rn] 5f⁷ 7s²

BOILS

2011 °C

CHARGE

+3, +4, +5, +6



DANGER

4/5 Severe

Why no photograph? Americium is synthetic and radioactive - yet a microscopic sealed speck sits inside almost every smoke detector, quietly watching for smoke. You still never see the bare metal.



Cm

CURIUM

POWER SOURCE FOR MARS ROVERS (IN SOME CONFIGURATIONS)

MASS

[247]

ELECTRONS

[Rn] 5f⁷ 6d¹ 7s²

BOILS

3110 °C

CHARGE

+3, +4



DANGER

5/5 Extreme

Why no photograph? Curium is so radioactive it glows from its own energy. A sealed speck has flown on Mars rovers to read the chemistry of rocks, but it never leaves shielded handling.



BK

BERKELIUM

SYNTHESIZED AT UC BERKELEY BY GLENN SEABORG'S TEAM IN 1949

MASS

[247]

ELECTRONS

[Rn] 5f⁹ 7s²

BOILS

2627 °C

CHARGE

+3, +4



DANGER

5/5 Extreme

Why no photograph? Berkelium has only ever been made in amounts smaller than a grain of sand, in a handful of labs on Earth. Almost no one has ever seen it.



Cf

CALIFORNIUM

STRONG NEUTRON EMITTER - USED IN OIL-WELL LOGGING, TREATMENT OF CERVICAL CANCER, AND AS A STARTING MATERIAL FOR HEAVIER...

MASS

[251]

ELECTRONS

[Rn] 5f¹⁰ 7s²

BOILS

1470 °C

CHARGE

+2, +3, +4



DANGER

5/5 Extreme

Why no photograph? Californium is among the most expensive substances on Earth, made in microscopic specks. A glimpse or two has been recorded - but you will never encounter it.



ES

EINSTEINIUM

FIRST IDENTIFIED IN THE FALLOUT OF THE “IVY MIKE” HYDROGEN-BOMB TEST (1952)

MASS
[252]

ELECTRONS
[Rn] 5f¹¹ 7s²

BOILS
996 °C

CHARGE
+3



DANGER
5/5 Extreme

Why no photograph? Einsteinium has only been made in invisible trace amounts; the largest samples ever made glow from their own radioactivity. Essentially no one has seen it.



Fm

FERMIUM

HEAVIEST ELEMENT ACCESSIBLE BY NEUTRON-CAPTURE CASCADE -
BEYOND FM REQUIRES HEAVY-ION BOMBARDMENT

MASS

[257]

ELECTRONS

[Rn] 5f¹² 7s²

BOILS

-

CHARGE

+2, +3



DANGER

5/5 Extreme

Why no photograph? Fermium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Md

MENDELEVIVM

FIRST SYNTHESIZED ONE ATOM AT A TIME AT UC BERKELEY (1955)

MASS

[258]

ELECTRONS

[Rn] 5f¹³ 7s²

BOILS

—

CHARGE

+2, +3



DANGER

5/5 Extreme

Why no photograph? Mendeleevium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



No

NOBELIUM

DISCOVERY CONTESTED BETWEEN BERKELEY, DUBNA, AND THE NOBEL INSTITUTE IN STOCKHOLM - NAME WAS THE POLITICAL COMPROMISE

MASS
[259]

ELECTRONS
[Rn] 5f¹⁴ 7s²

BOILS
—

CHARGE
+2, +3



DANGER
5/5 Extreme

Why no photograph? Nobelium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Lr

LAWRENCIUM

LAST ACTINIDE

MASS

[266]

ELECTRONS

[Rn] 5f¹⁴ 7s² 7p¹

BOILS

—

CHARGE

+3



DANGER

5/5 Extreme

Why no photograph? Lawrencium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Rf

RUTHERFORDIUM

FIRST ELEMENT OF THE D-BLOCK SUPER-HEAVIES

MASS

[267]

ELECTRONS

[Rn] 5f¹⁴ 6d² 7s²

BOILS

—

CHARGE

+4



DANGER

5/5 Extreme

Why no photograph? Rutherfordium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Db

DUBNIUM

SYNTHESIZED AT THE JINR (JOINT INSTITUTE FOR NUCLEAR RESEARCH) IN DUBNA, RUSSIA

MASS

[268]

ELECTRONS

[Rn] 5f¹⁴ 6d³ 7s²

BOILS

—

CHARGE

+5



DANGER

5/5 Extreme

Why no photograph? Dubnium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Sg

SEABORGIUM

THE ONLY ELEMENT OFFICIALLY NAMED FOR A PERSON WHO WAS ALIVE AT THE NAMING

MASS

[269]

ELECTRONS

[Rn] 5f¹⁴ 6d⁴ 7s²

BOILS

—

CHARGE

+6



DANGER

5/5 Extreme

Why no photograph? Seaborgium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Bh

BOHRIUM

SYNTHESIZED AT GSI DARMSTADT (1981)

MASS
[270]

ELECTRONS
[Rn] 5f¹⁴ 6d⁵ 7s²

BOILS
—

CHARGE
+7



DANGER
5/5 Extreme

Why no photograph? Bohrium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Hs

HASSIUM

SYNTHESIZED AT GSI IN DARMSTADT

MASS

[269]

ELECTRONS

[Rn] 5f¹⁴ 6d⁶ 7s²

BOILS

—

CHARGE

+8



DANGER

5/5 Extreme

Why no photograph? Hassium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Mt

MEITNERIUM

HONORS THE UNRECOGNIZED CO-DISCOVERER OF NUCLEAR FISSION

MASS

[278]

ELECTRONS

[Rn] 5f¹⁴ 6d⁷ 7s²

BOILS

—

CHARGE

+3, +4, +6



DANGER

5/5 Extreme

Why no photograph? Meitnerium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Ds

DARMSTADIUM

SYNTHESIZED AT GSI DARMSTADT IN 1994

MASS

[281]

ELECTRONS

[Rn] 5f¹⁴ 6d⁸ 7s²

BOILS

—

CHARGE

+2, +4, +6



DANGER

5/5 Extreme

Why no photograph? Darmstadtium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Rg

ROENTGENIUM

HONORS THE DISCOVERER OF X-RAYS

MASS
[282]

ELECTRONS
[Rn] 5f¹⁴ 6d⁹ 7s²

BOILS
—

CHARGE
+3, +5



DANGER
5/5 Extreme

Why no photograph? Roentgenium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Cn

COPERNICIUM

CLOSES THE D-BLOCK

MASS

[285]

ELECTRONS

[Rn] 5f¹⁴ 6d¹⁰ 7s²

BOILS

—

CHARGE

+2



DANGER

5/5 Extreme

Why no photograph? Copernicium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Nh

NIHONIUM

FIRST ELEMENT DISCOVERED IN ASIA

MASS

[286]

ELECTRONS

[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p¹

BOILS

—

CHARGE

+1, +3, +5



DANGER

5/5 Extreme

Why no photograph? Nihonium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Fl

FLEROVIUM

IN THE PREDICTED “ISLAND OF STABILITY” - FL-298 MAY HAVE A HALF-LIFE OF YEARS RATHER THAN SECONDS, IF ANYONE CAN EVER...

MASS

[289]

ELECTRONS

[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p²

BOILS

—

CHARGE

+2, +4



DANGER

5/5 Extreme

Why no photograph? Flerovium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Mc

MOSCOVIUM

SYNTHESIZED AT DUBNA (2003)

MASS
[290]

ELECTRONS
[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p³

BOILS
—

CHARGE
+1, +3



DANGER
5/5 Extreme

Why no photograph? Moscovium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Lv

LIVERMORIUM

SYNTHESIZED 2000 AT DUBNA IN COLLABORATION WITH LAWRENCE LIVERMORE

MASS

[293]

ELECTRONS

[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁴

BOILS

–

CHARGE

+2, +4



DANGER

5/5 Extreme

Why no photograph? Livermorium is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Ts

TENNESSINE

THE NEWEST HALOGEN - SITS BELOW ASTATINE ON THE PERIODIC TABLE

MASS

[294]

ELECTRONS

[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁵

BOILS

—

CHARGE

-1, +1, +3, +5



DANGER

5/5 Extreme

Why no photograph? Tennessine is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.



Og

OGANESSON

HEAVIEST ELEMENT EVER SYNTHESIZED

MASS

[294]

ELECTRONS

[Rn] 5f¹⁴ 6d¹⁰ 7s² 7p⁶

BOILS

—

CHARGE

0, +2, +4



DANGER

5/5 Extreme

Why no photograph? Oganesson is a synthetic element made only in vanishingly small, intensely radioactive amounts - its atoms decay so quickly that no piece big enough to see or photograph has ever existed.

