



Scandium

Scandium **Sc**<sup>21</sup>

44,956  
1,2  
[Ar] 3d<sup>1</sup>4s<sup>2</sup>

**Scandium**

is named after the Latin  
"Scandia", meaning Scandinavia.

**Transition  
Metal**

**Transition  
Metal**  
+



Parts of the MiG-29  
are made from Al-Sc alloy

**Solid**  
Silvery-white metal.  
Uses: stadium lights,  
large screen TV's  
and aluminium-  
scandium alloys  
(bicycle frames).



Titanium

Titanium

**Ti**<sup>22</sup>

47,88

1,3

[Ar] 3d<sup>2</sup>4s<sup>2</sup>

**Titanium**

is from the Latin "titan",  
meaning Earth; also for the  
"Titans", Greek gods.

**Transition  
Metal**

**Transition  
Metal**  
×

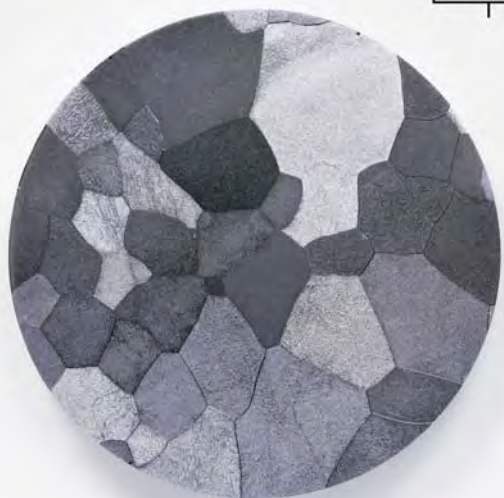


Titanium panels of the  
Guggenheim Museum, Bilbao

**Solid**

Strong, corrosion-resistant metal.

Uses: surgical implants, jewellery; aircraft, spacecraft, armor plating, naval ships and missiles.



Vanadium, etched

Vanadium

V

23

50,942

1,5

[Ar] 3d<sup>3</sup>4s<sup>2</sup>

**Vanadium**

is named after “Vanadís”, one of the names of the goddess Freyja in Norse mythology.

Transition  
Metal

Transition  
Metal  
×

Bluebell tunicates contain vanadium as vanabin (vanadium-binding metalloproteins)



**Solid**

Soft, silver-grey,  
ductile metal.

Uses: steel additive  
for axles, bicycle  
frames, crankshafts,  
tools, gears, etc.



Chromium crystals

Chromium

**Cr**<sup>24</sup>

51,996

1,6

[Ar] 3d<sup>5</sup>4s<sup>1</sup>

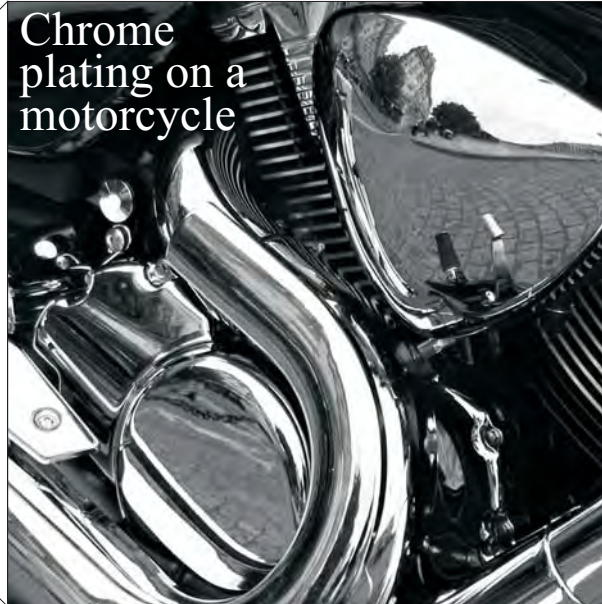
**Chromium**

is named after the Greek  
"chr ma", meaning colour,  
because of many colors of its  
compounds.

Transition  
Metal

Transition  
Metal  
+

Chrome  
plating on a  
motorcycle



**Solid**

Soft, steely-grey,  
hard metal.

Uses: stainless steel,  
chrome-plating;  
colours rubies red,  
emeralds green.



Manganese

Manganese

**Mn**<sup>25</sup>

51,996

1,6

[Ar] 3d<sup>5</sup>4s<sup>2</sup>

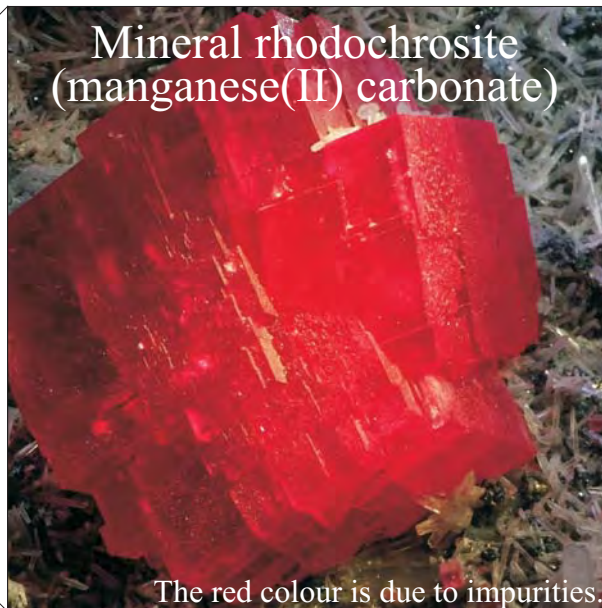
Manganese

is named after "Magnesia" in Greece.

Transition Metal

Transition Metal

Mineral rhodochrosite (manganese(II) carbonate)

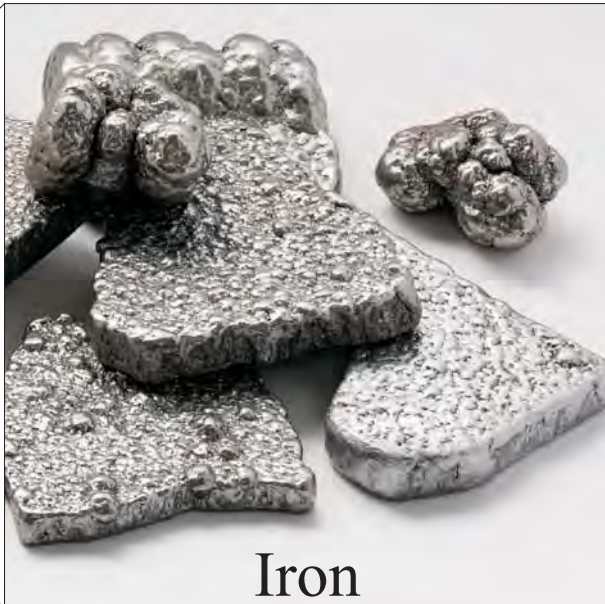


The red colour is due to impurities.

**Solid**

Silvery-grey metal, looks like iron.

Uses: steel additive, added to petrol to boost octane rating, pigment to colour ceramics and glass.



Iron

Iron **Fe**<sup>26</sup>

55,845

1,6

[Ar] 3d<sup>6</sup>4s<sup>2</sup>

# Iron

is derived from the Anglo-Saxon "Isern, meaning "holy or strong metal".  
The symbol Fe is from Latin "ferrum", meaning iron.

**Transition Metal**

**Transition Metal**  
+

Prussian blue



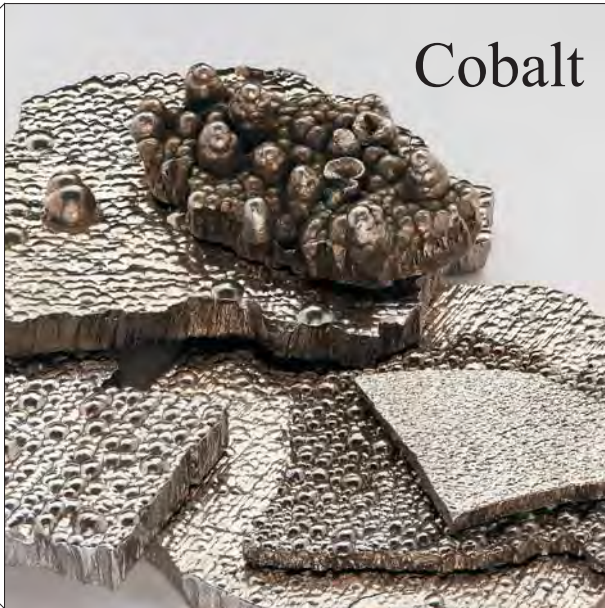
Dark blue pigment: formula Fe<sub>7</sub>(CN)<sub>18</sub>·14H<sub>2</sub>O

## Solid

Greyish metal.

It's most common element on Earth.

Uses: machinery, tools, automobiles, ships, colours blood red, blue pigment.



Cobalt

Cobalt



58,993

1,7

[Ar] 3d<sup>7</sup>4s<sup>2</sup>

**Cobalt**

is derived from the German  
“Kobold”, meaning “gremlin”.  
Miners called it so because it  
was poisonous and trouble-  
some.

**Transition  
Metal**

**Transition  
Metal**  
+



Cobalt blue glass

**Solid**

Hard lustrous grey  
metal.

Uses: alloys, lithium  
ion batteries, blue  
coloured glass, pig-  
ments for paintings.



Nickel

Nickel **Ni**<sup>28</sup>

58,693  
1,8  
[Ar] 3d<sup>8</sup>4s<sup>2</sup>

Transition  
Metal<sup>+</sup>

**Nickel**

is from the Swedish,  
"Kopparnickel", meaning  
"copper-colored ore".

Transition  
Metal

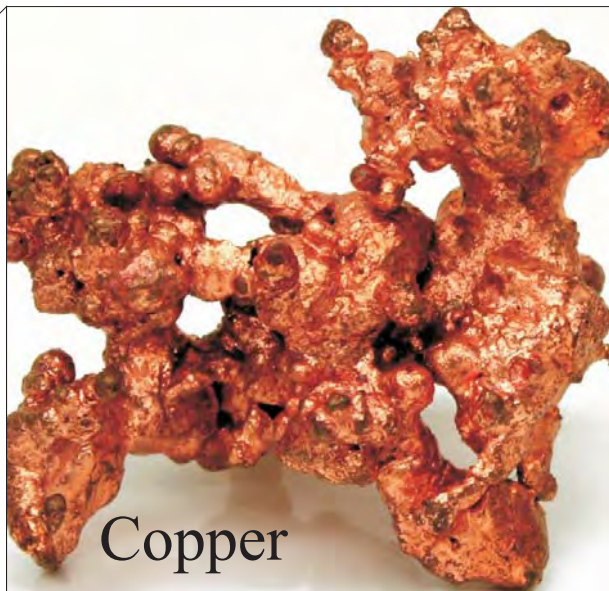


Jet engine turbine blade  
from nickel superalloy

**Solid**  
Silver metal with a  
gold tinge.

Uses: stainless steel,  
magnets, recharge-  
able batteries, coins,  
electric guitar strings





Copper

Copper  
**Cu**<sup>29</sup>

63,546

1,8

[Ar] 3d<sup>10</sup>4s<sup>1</sup>

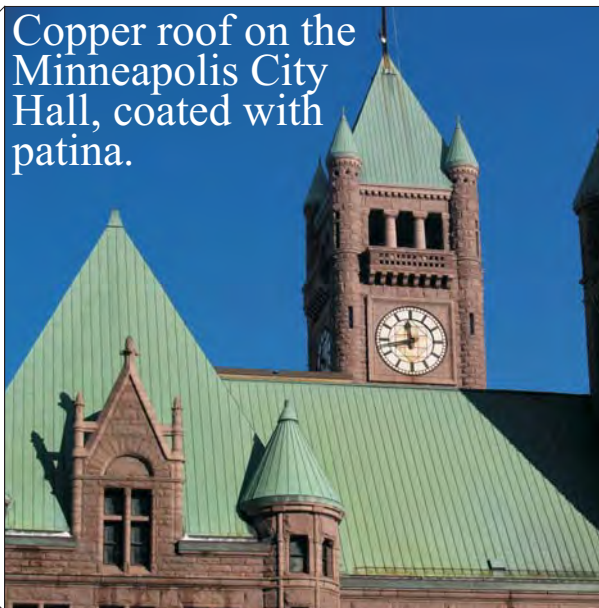
**Copper**

is from the Greek name of  
Cyprus, "Kyprios", where a  
lot of copper was mined.

**Transition  
Metal**

**Transition  
Metal**  
×

Copper roof on the  
Minneapolis City  
Hall, coated with  
patina.



**Solid**

Red-orange, soft and  
malleable metal.

Uses: conductor of  
heat and electricity,  
roofing material,  
cooking utensils,  
jewellery, statues.



Zinc

Zinc **Zn**<sup>30</sup>

65,41

1,7

[Ar] 3d<sup>10</sup>4s<sup>2</sup>

Zinc

from the German "Zinken",  
meaning "prong or point".

Transition  
Metal

Transition  
Metal  
+



Disassembled  
zinc chloride cell

**Solid**

Bluish-white, dia-  
magnetic metal.

Uses: galvanizing,  
diecasting, brass &  
bronze, batteries,  
dietary supplement.



Yttrium

Yttrium

**Y**

39

88,906

1,1

[Kr] 4d<sup>1</sup>5s<sup>2</sup>

**Yttrium**

is named after "Ytterby", the village in Sweden.

**Transition Metal**

**Transition Metal**  
+



Yttrium barium copper oxide (YBCO) superconductor

**Solid**

Soft, silvery-white, crystalline.

Uses: fibre optics, energy-efficient light bulbs, treatment of cancers, TV's.



Zirconium

Zirconium

**Zr**<sup>40</sup>

91,225

1,2

[Kr] 4d<sup>2</sup>5s<sup>2</sup>

**Zirconium**

is derived from the Arabic  
“zarkûn”, meaning “gold  
like”.

**Transition  
Metal**

**Transition  
Metal**  
+



Brilliant-cut cubic zirconia

**Solid**

Soft, silvery-white,  
crystalline.

Uses: surgical  
instruments, heat  
resistant parts, made  
into diamond-like  
gemstones.



Niobium

Niobium **Nb**<sup>41</sup>

92,906

1,2

[Kr] 4d<sup>4</sup>5s<sup>1</sup>

**Niobium**

is named after "Niobe",  
daughter of Tantalus in  
classical Greek mythology;  
Niobe means "snowy".

**Transition  
Metal**

**Transition  
Metal**  
×

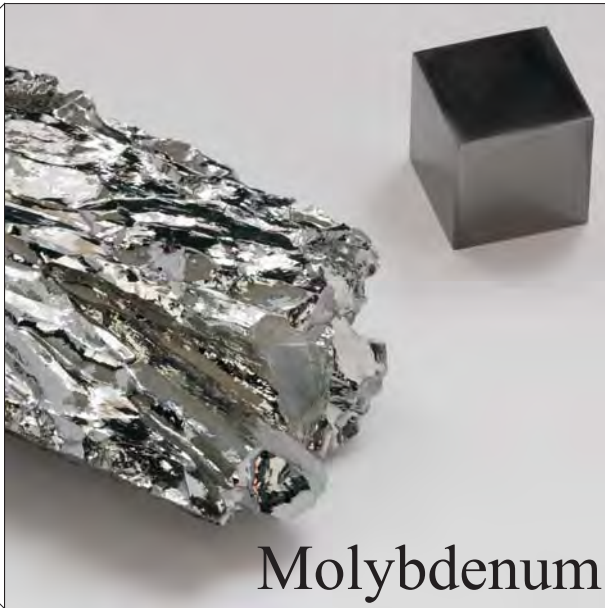


The black rocket nozzle of Apollo 15 is made from niobium-titanium alloy.

**Solid**

Grey, metallic;  
blueish oxidised.

Used in mobile  
telephones, super-  
conducting magnets  
in MRI's, comme-  
morative coins.



Molybdenum

Molybdenum

**Mo**<sup>42</sup>

95,94

1,3

[Kr] 4d<sup>5</sup>5s<sup>1</sup>

**Molybdenum**

is from the Greek "molybdos",  
meaning "lead".

**Transition  
Metal**

**Transition  
Metal**  
×



MoSi<sub>2</sub> heating element

**Solid**

Silvery white metal,  
melts at 2,623 °C.

Used in filaments in  
heaters, in steel for  
airplane and auto  
engines.



Technetium

Technetium

**Tc**<sup>43</sup>

98,906

1,4

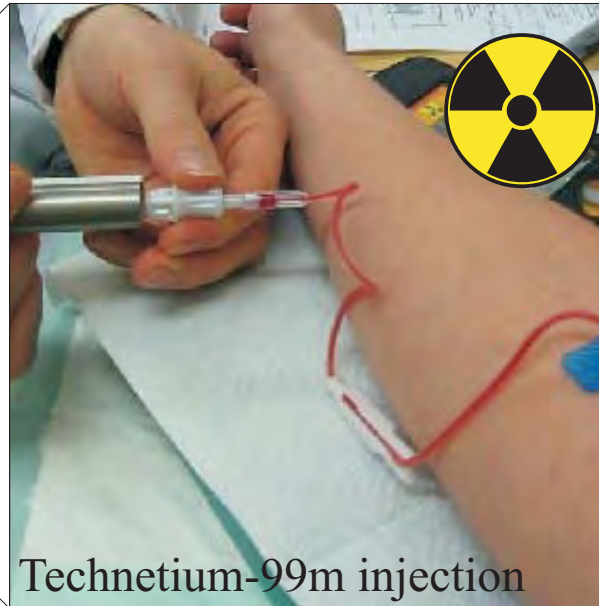
[Kr] 4d<sup>6</sup>5s<sup>1</sup>

**Technetium**

is from the Greek “technetos”,  
meaning “artificial”.

**Transition  
Metal**

**Transition  
Metal**  
×



Technetium-99m injection

**Solid**

Silvery grey radio-  
active metal.

Used as radioactive  
tracer in medical  
tests, equipment  
calibration (beta  
emitter).