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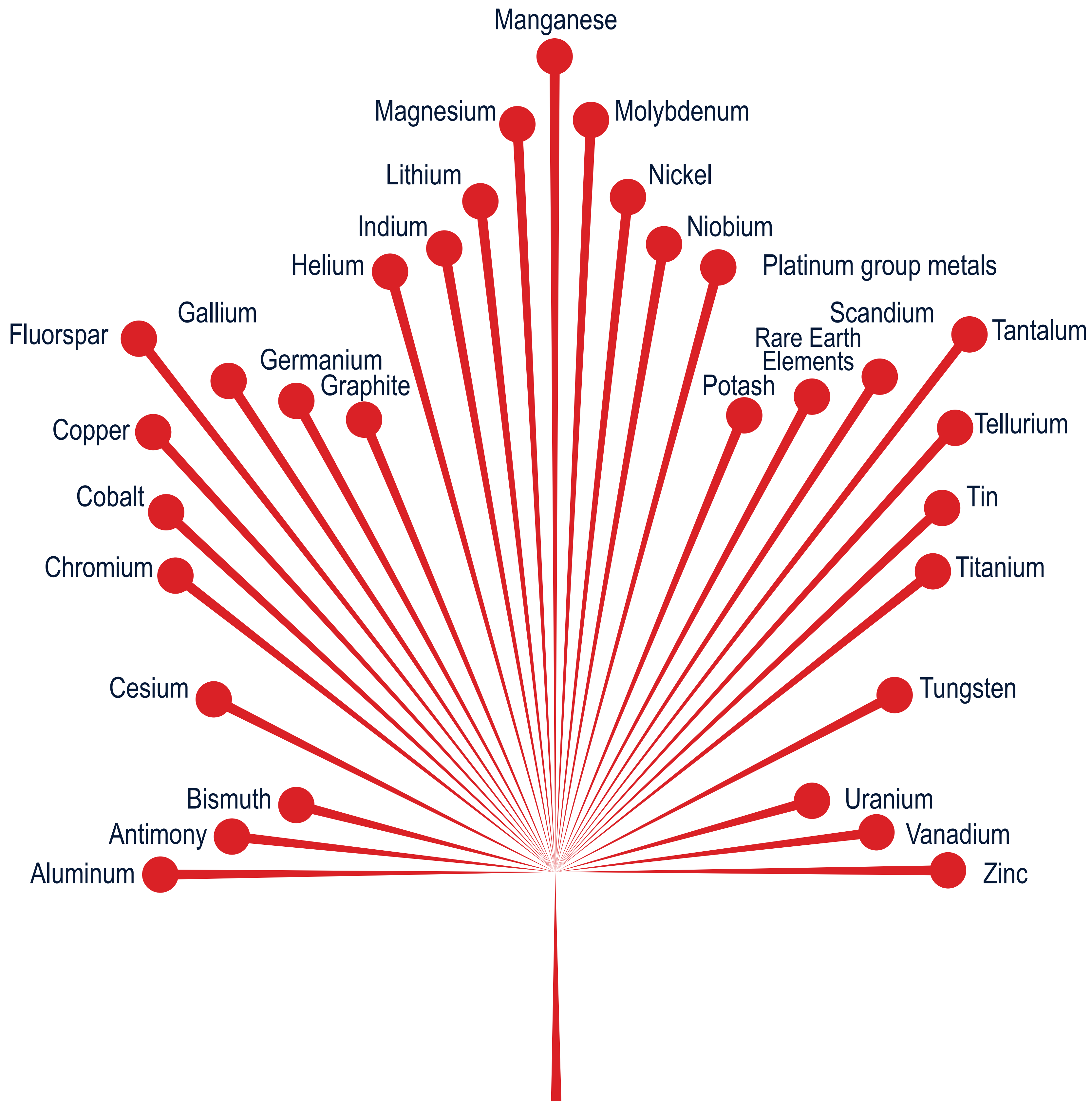

CANADA'S
CRITICAL MINERALS LIST
2021

ESSENTIAL TO CANADA'S ECONOMIC SECURITY

REQUIRED FOR CANADA'S TRANSITION TO A LOW-CARBON ECONOMY

A SUSTAINABLE SOURCE OF CRITICAL MINERALS FOR OUR PARTNERS

For more information, visit our website at nrcan.gc.ca/criticalminerals

Canada's list of critical minerals was prepared in consultation with the provinces, territories and industry.

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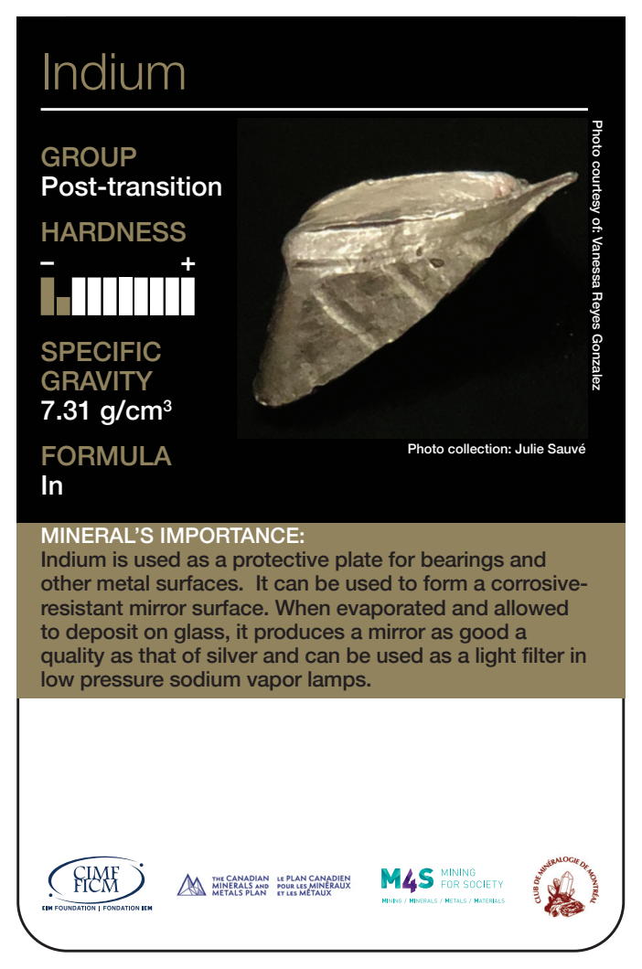


Indium

GROUP
Post-transition

HARDNESS

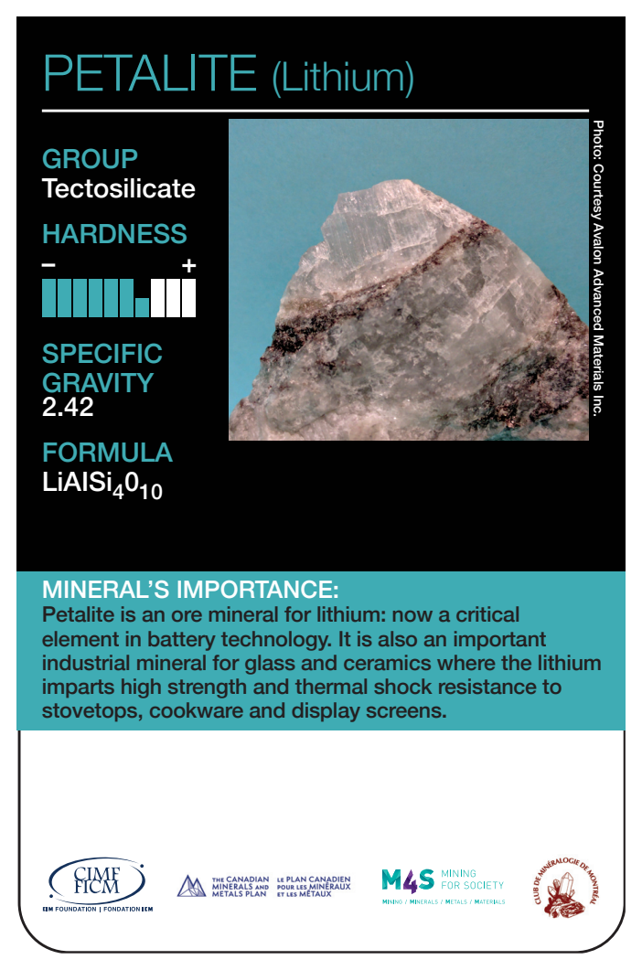
SPECIFIC GRAVITY
7.31 g/cm³

FORMULA
In

Photo collection: Julie Sauvé

Photo courtesy of: Vanessa Reyes Gonzalez

MINERAL'S IMPORTANCE:
Indium is used as a protective plate for bearings and other metal surfaces. It can be used to form a corrosive-resistant mirror surface. When evaporated and allowed to deposit on glass, it produces a mirror as good a quality as that of silver and can be used as a light filter in low pressure sodium vapor lamps.



PETALITE (Lithium)

GROUP
Tectosilicate

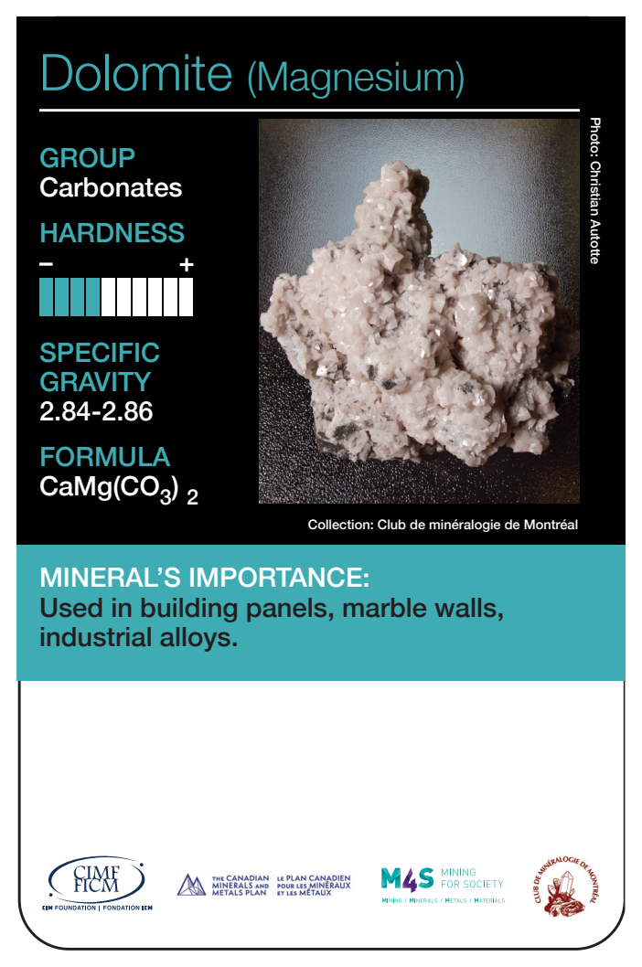
HARDNESS

SPECIFIC GRAVITY
2.42

FORMULA
$LiAlSi_40_{10}$

Photo: Courtesy Avalon Advanced Materials Inc.

MINERAL'S IMPORTANCE:
Petalite is an ore mineral for lithium: now a critical element in battery technology. It is also an important industrial mineral for glass and ceramics where the lithium imparts high strength and thermal shock resistance to stovetops, cookware and display screens.



Dolomite (Magnesium)

GROUP
Carbonates

HARDNESS

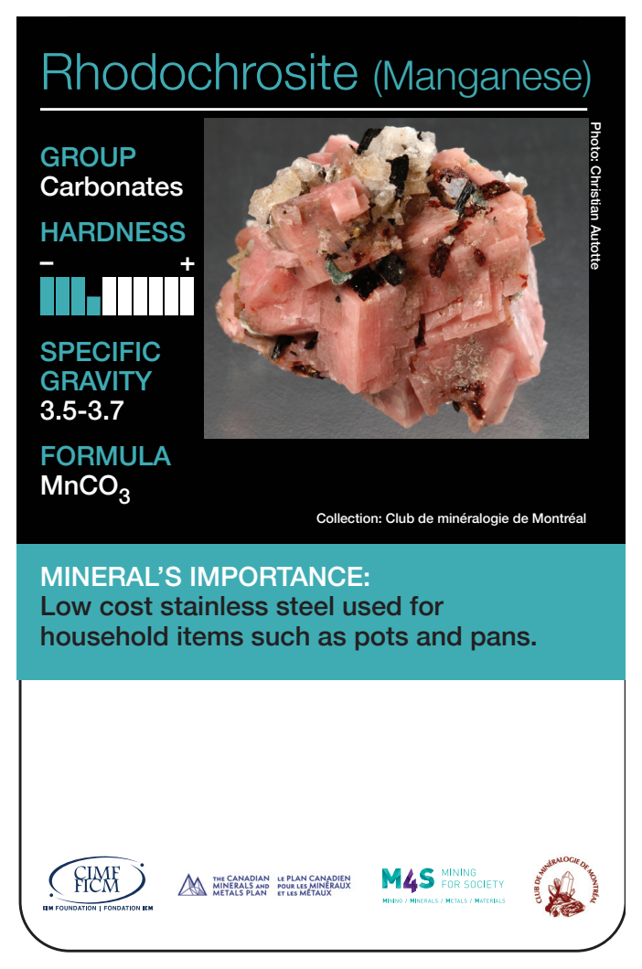
SPECIFIC GRAVITY
2.84-2.86

FORMULA
$CaMg(CO_3)_2$

Photo: Christian Autotte

Collection: Club de minéralogie de Montréal

MINERAL'S IMPORTANCE:
Used in building panels, marble walls, industrial alloys.



Rhodochrosite (Manganese)

GROUP
Carbonates

HARDNESS

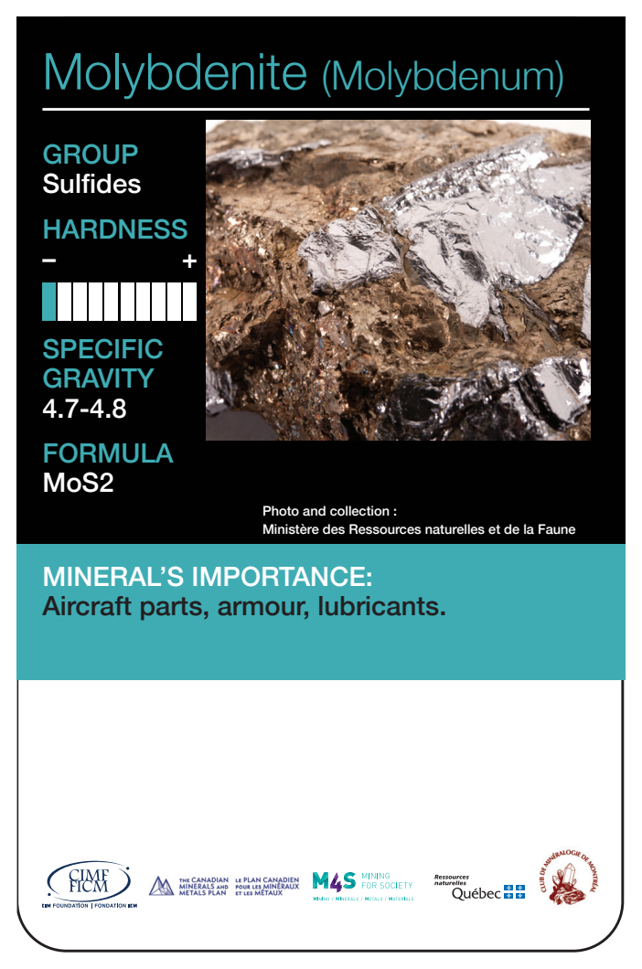
SPECIFIC GRAVITY
3.5-3.7

FORMULA
$MnCO_3$

Photo: Christian Autotte

Collection: Club de minéralogie de Montréal

MINERAL'S IMPORTANCE:
Low cost stainless steel used for household items such as pots and pans.



Molybdenite (Molybdenum)

GROUP
Sulfides

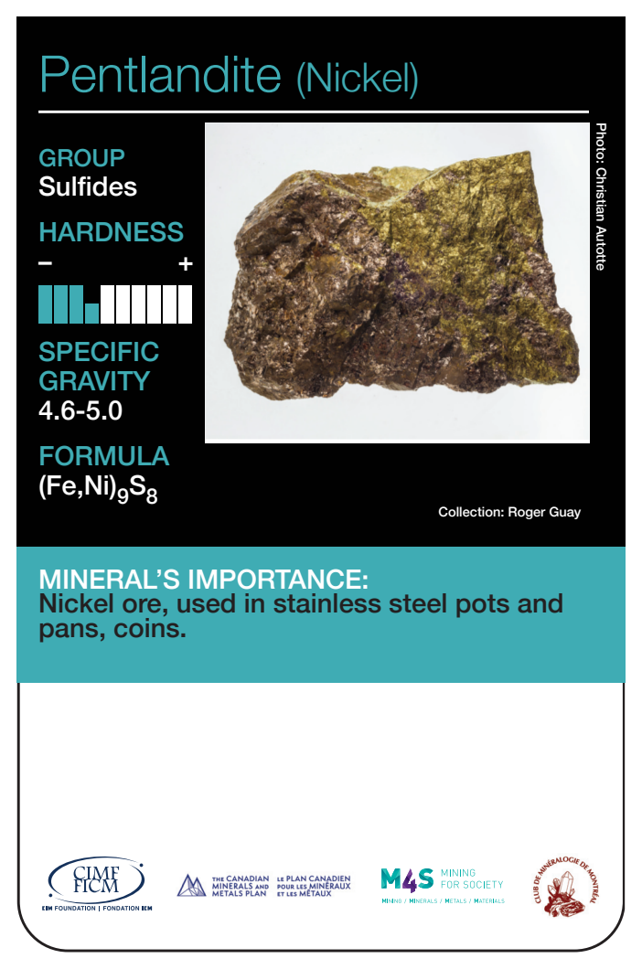
HARDNESS

SPECIFIC GRAVITY
4.7-4.8

FORMULA
MoS2

Photo and collection :
Ministère des Ressources naturelles et de la Faune

MINERAL'S IMPORTANCE:
Aircraft parts, armour, lubricants.



Pentlandite (Nickel)

GROUP
Sulfides

HARDNESS

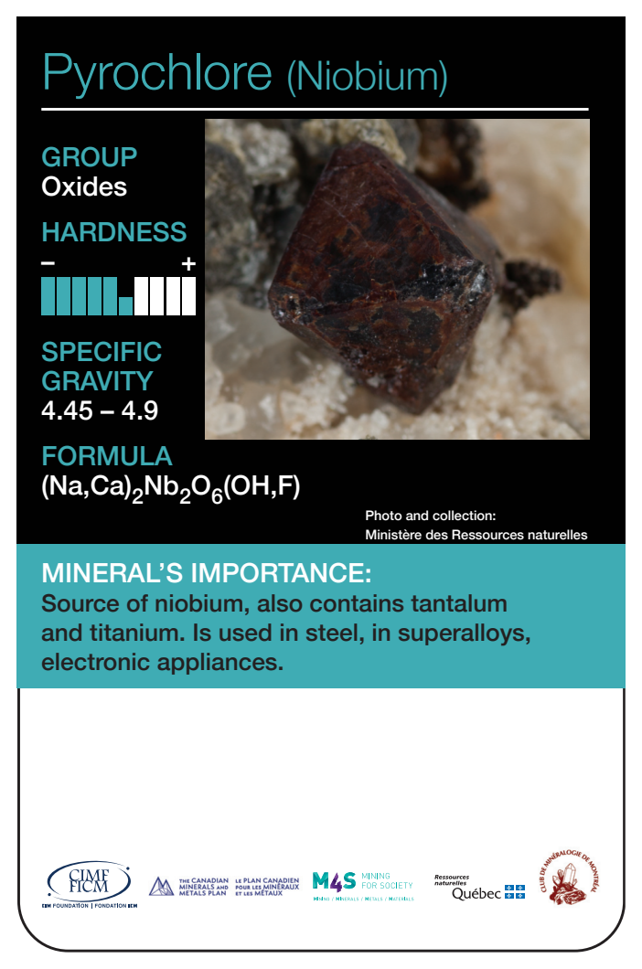
SPECIFIC GRAVITY
4.6-5.0

FORMULA
$(Fe,Ni)_9S_8$

Photo: Christian Autotte

Collection: Roger Guay

MINERAL'S IMPORTANCE:
Nickel ore, used in stainless steel pots and pans, coins.



Pyrochlore (Niobium)

GROUP
Oxides

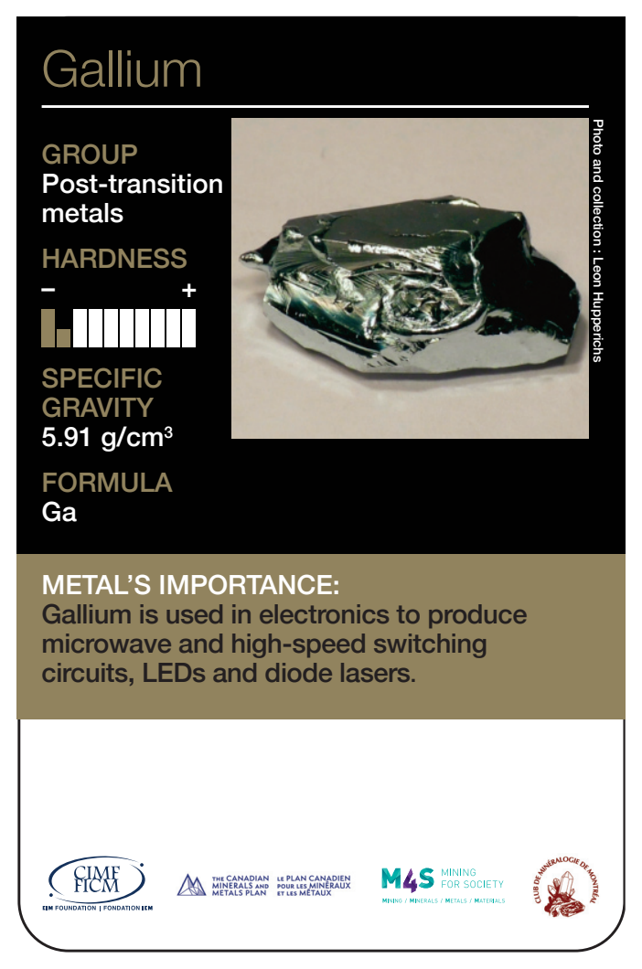
HARDNESS

SPECIFIC GRAVITY
4.45 – 4.9

FORMULA
$(Na,Ca)_2Nb_2O_6(OH,F)$

Photo and collection:
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
Source of niobium, also contains tantalum and titanium. Is used in steel, in superalloys, electronic appliances.



Gallium

GROUP
Post-transition metals

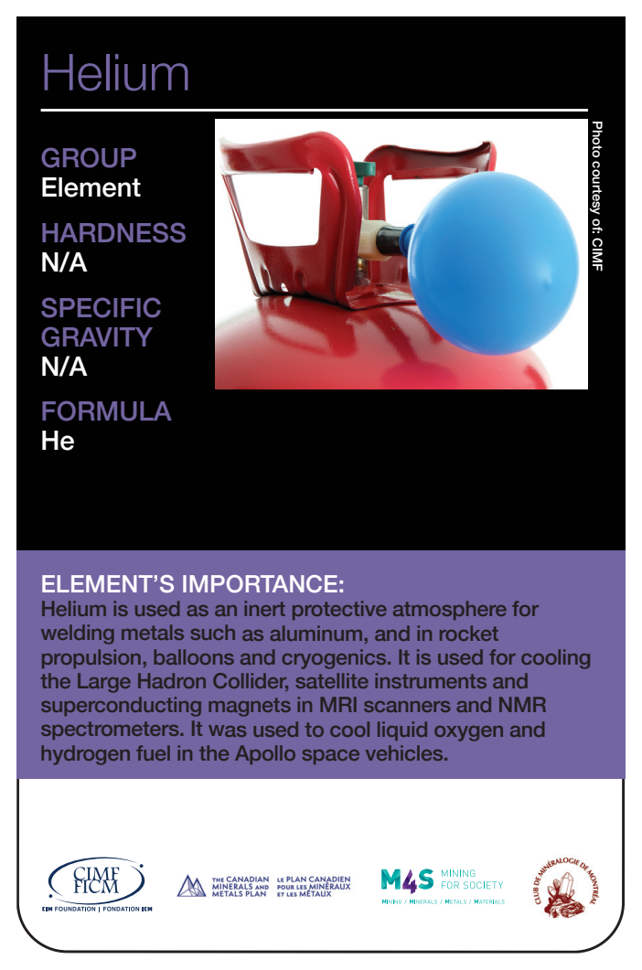
HARDNESS

SPECIFIC GRAVITY
5.91 g/cm³

FORMULA
Ga

Photo and collection : Leon Hupperichs

METAL'S IMPORTANCE:
Gallium is used in electronics to produce microwave and high-speed switching circuits, LEDs and diode lasers.



Helium

GROUP
Element

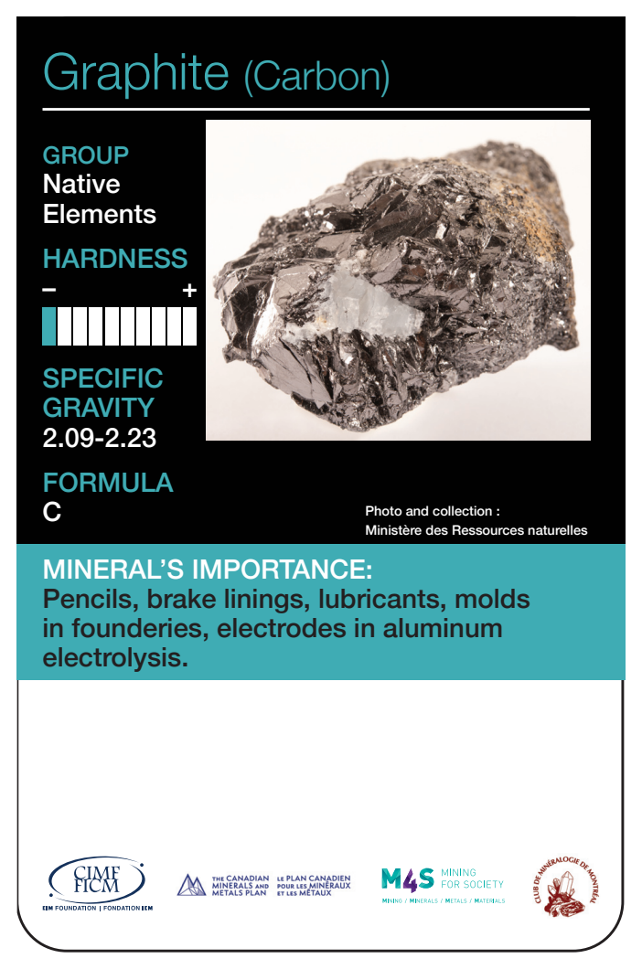
HARDNESS
N/A

SPECIFIC GRAVITY
N/A

FORMULA
He

Photo courtesy of: CIMF

ELEMENT'S IMPORTANCE:
Helium is used as an inert protective atmosphere for welding metals such as aluminum, and in rocket propulsion, balloons and cryogenics. It is used for cooling the Large Hadron Collider, satellite instruments and superconducting magnets in MRI scanners and NMR spectrometers. It was used to cool liquid oxygen and hydrogen fuel in the Apollo space vehicles.



Graphite (Carbon)

GROUP
Native Elements

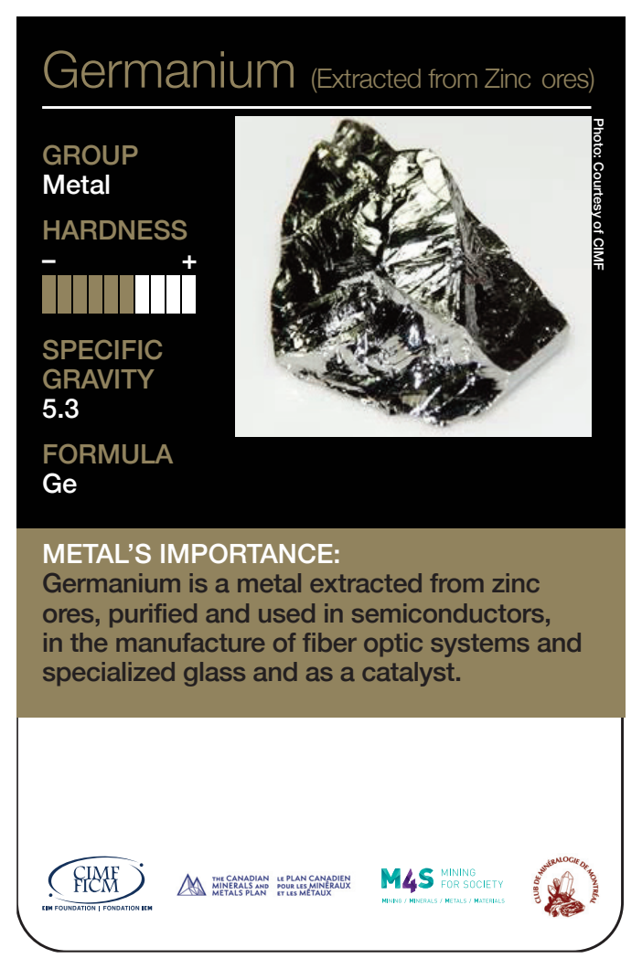
HARDNESS

SPECIFIC GRAVITY
2.09-2.23

FORMULA
C

Photo and collection :
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
Pencils, brake linings, lubricants, molds in founderies, electrodes in aluminum electrolysis.



Germanium (Extracted from Zinc ores)

GROUP
Metal

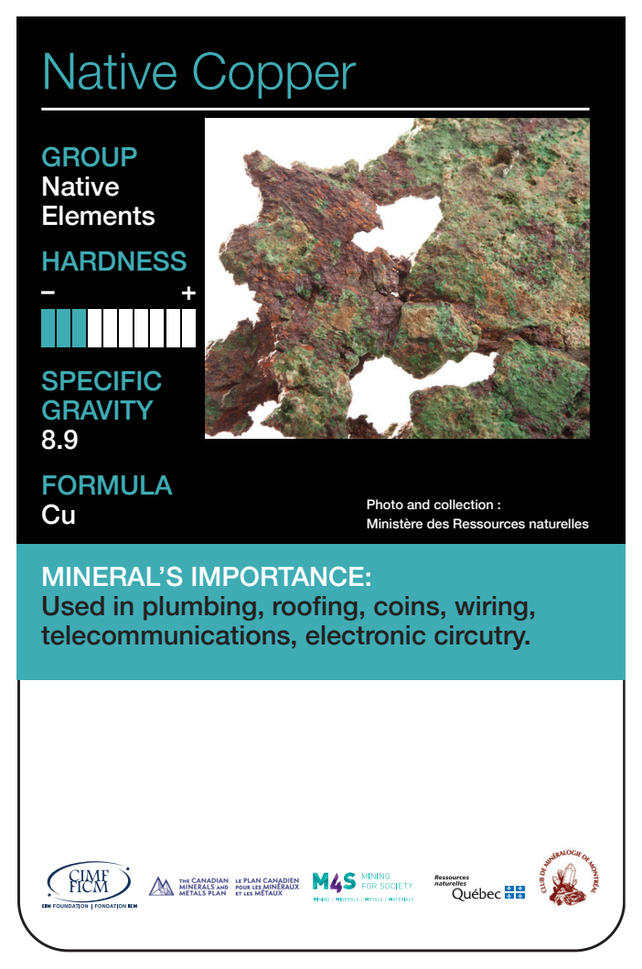
HARDNESS

SPECIFIC GRAVITY
5.3

FORMULA
Ge

Photo: Courtesy of CIMF

METAL'S IMPORTANCE:
Germanium is a metal extracted from zinc ores, purified and used in semiconductors, in the manufacture of fiber optic systems and specialized glass and as a catalyst.



Native Copper

GROUP
Native Elements

HARDNESS

SPECIFIC GRAVITY
8.9

FORMULA
Cu

Photo and collection :
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
Used in plumbing, roofing, coins, wiring, telecommunications, electronic circuitry.

Fluorite

GROUP
Halides

HARDNESS

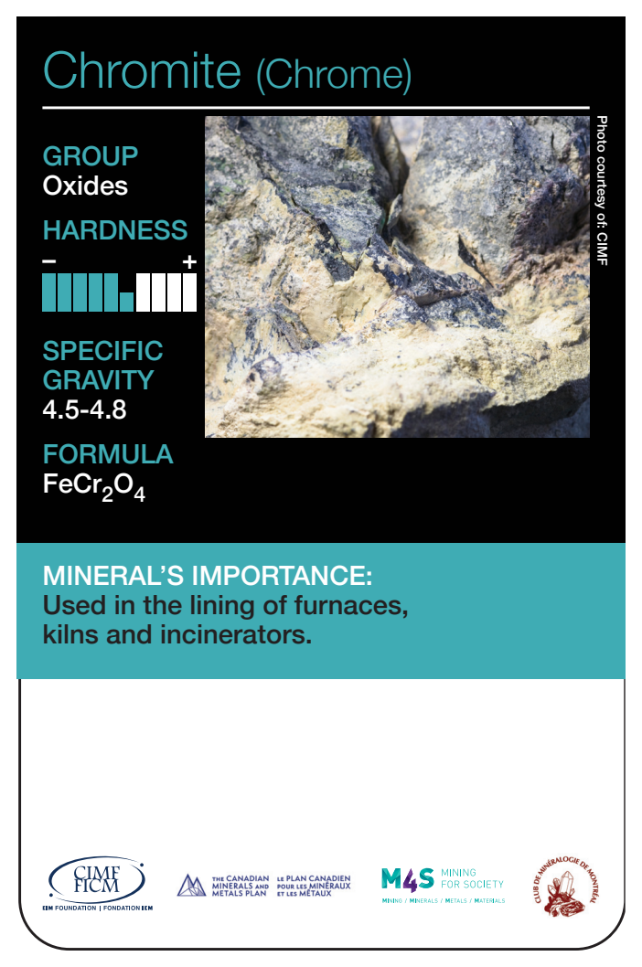
SPECIFIC GRAVITY
3.175–3.184

FORMULA
CaF_2

Photo: Christian Autotte

Collection: Club de minéralogie de Montréal

MINERAL'S IMPORTANCE:
Fluorine mineral, used in toothpaste, used as flux in metallurgy.



Chromite (Chrome)

GROUP
Oxides

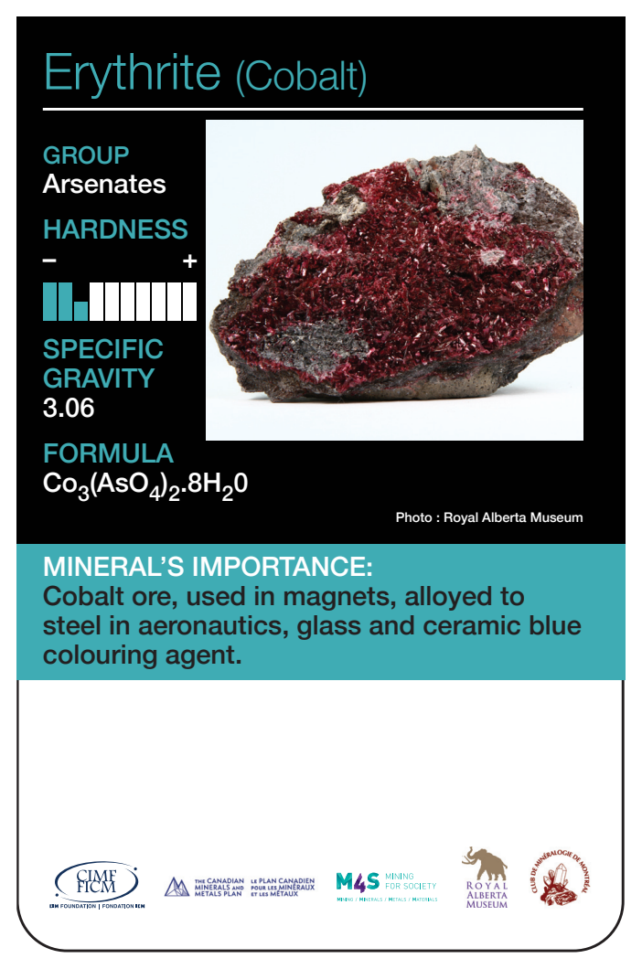
HARDNESS

SPECIFIC GRAVITY
4.5-4.8

FORMULA
$FeCr_2O_4$

Photo courtesy of: CIMF

MINERAL'S IMPORTANCE:
Used in the lining of furnaces, kilns and incinerators.



Erythrite (Cobalt)

GROUP
Arsenates

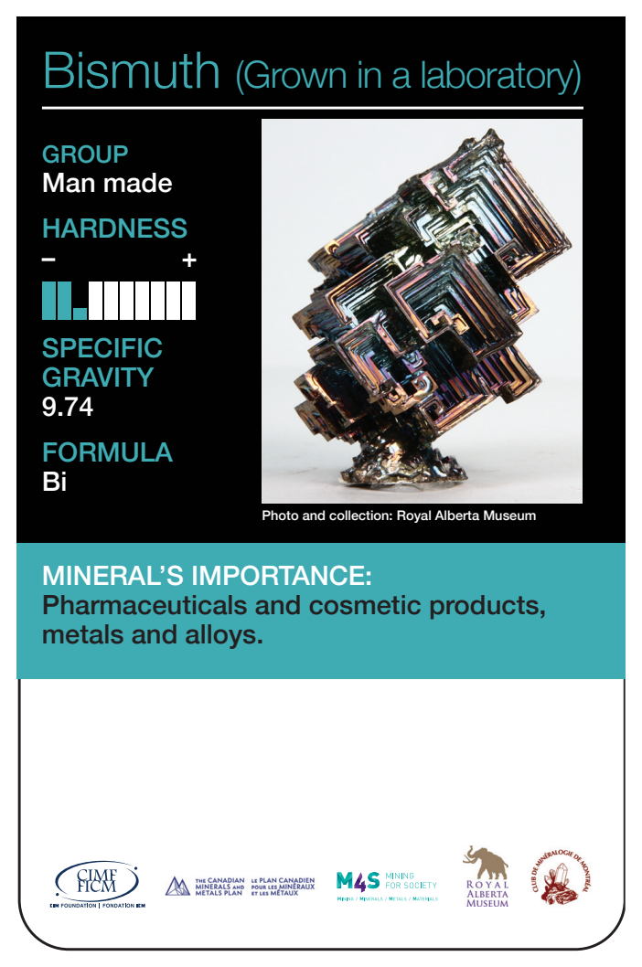
HARDNESS

SPECIFIC GRAVITY
3.06

FORMULA
$Co_3(AsO_4)_2.8H_20$

Photo : Royal Alberta Museum

MINERAL'S IMPORTANCE:
Cobalt ore, used in magnets, alloyed to steel in aeronautics, glass and ceramic blue colouring agent.



Bismuth (Grown in a laboratory)

GROUP
Man made

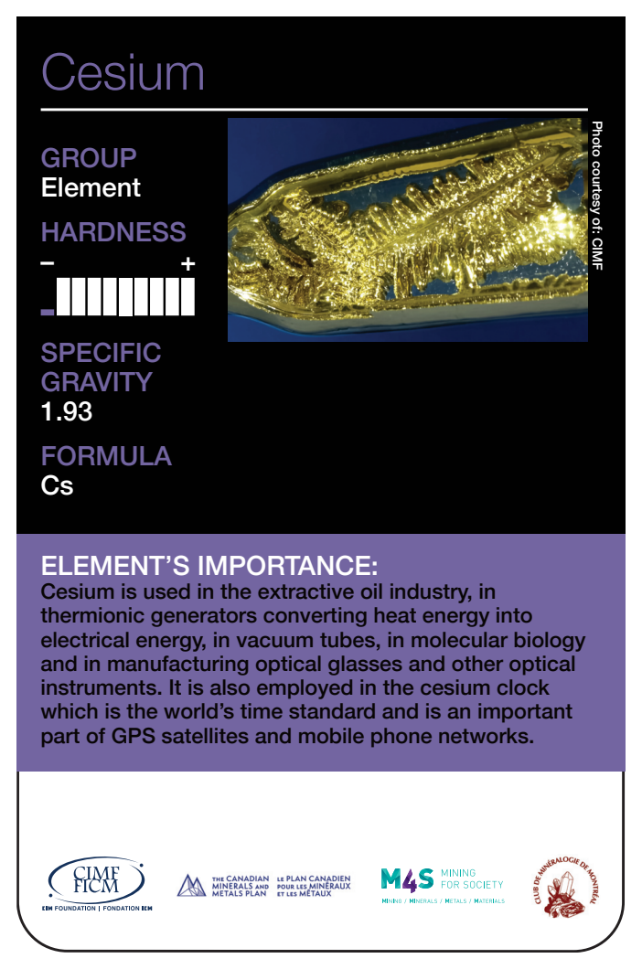
HARDNESS

SPECIFIC GRAVITY
9.74

FORMULA
Bi

Photo and collection: Royal Alberta Museum

MINERAL'S IMPORTANCE:
Pharmaceuticals and cosmetic products, metals and alloys.



Cesium

GROUP
Element

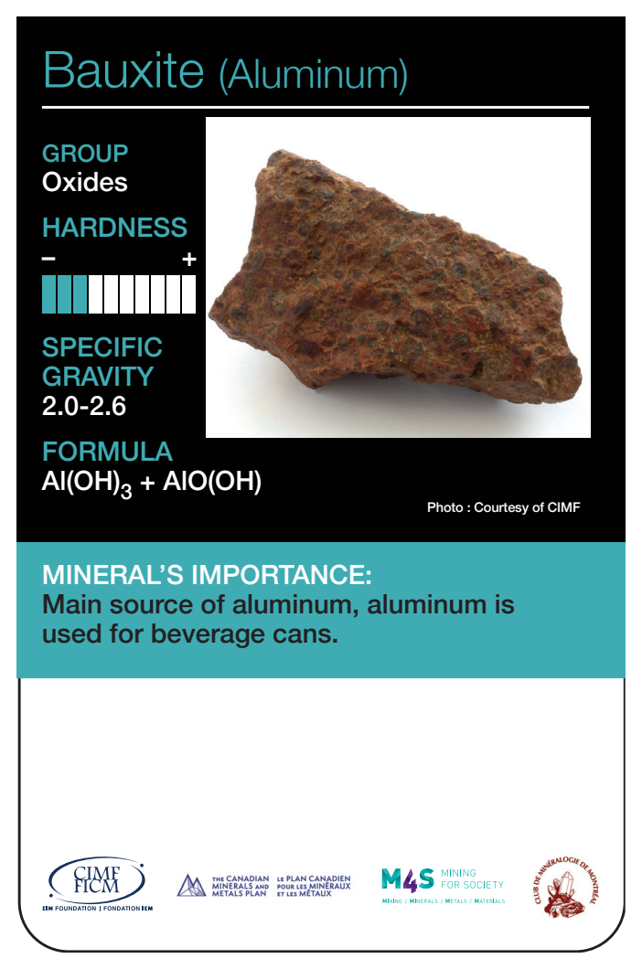
HARDNESS

SPECIFIC GRAVITY
1.93

FORMULA
Cs

Photo courtesy of: CIMF

ELEMENT'S IMPORTANCE:
Cesium is used in the extractive oil industry, in thermionic generators converting heat energy into electrical energy, in vacuum tubes, in molecular biology and in manufacturing optical glasses and other optical instruments. It is also employed in the cesium clock which is the world's time standard and is an important part of GPS satellites and mobile phone networks.



Bauxite (Aluminum)

GROUP
Oxides

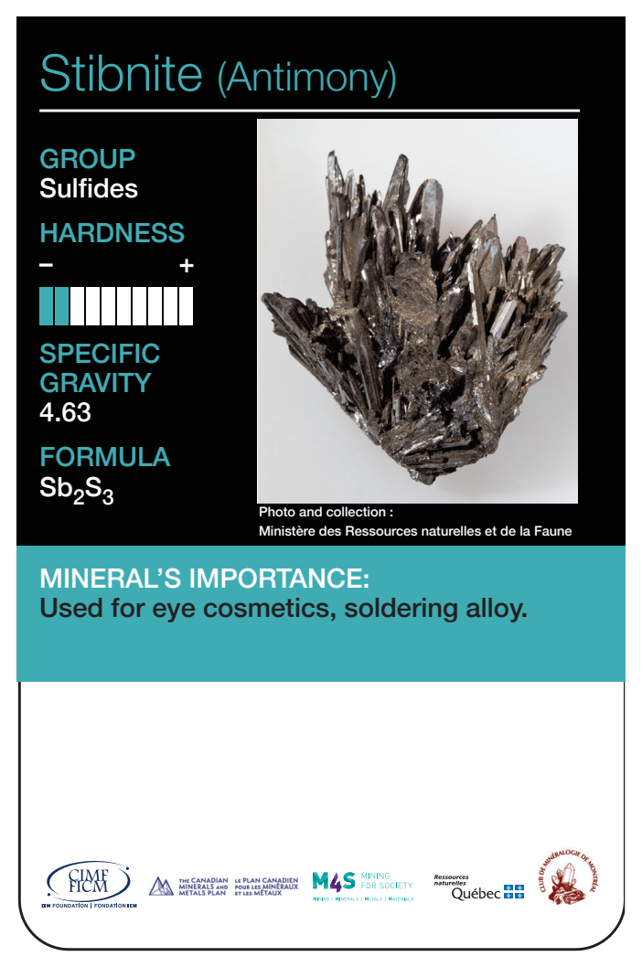
HARDNESS

SPECIFIC GRAVITY
2.0-2.6

FORMULA
$Al(OH)_3 + AlO(OH)$

Photo : Courtesy of CIMF

MINERAL'S IMPORTANCE:
Main source of aluminum, aluminum is used for beverage cans.



Stibnite (Antimony)

GROUP
Sulfides

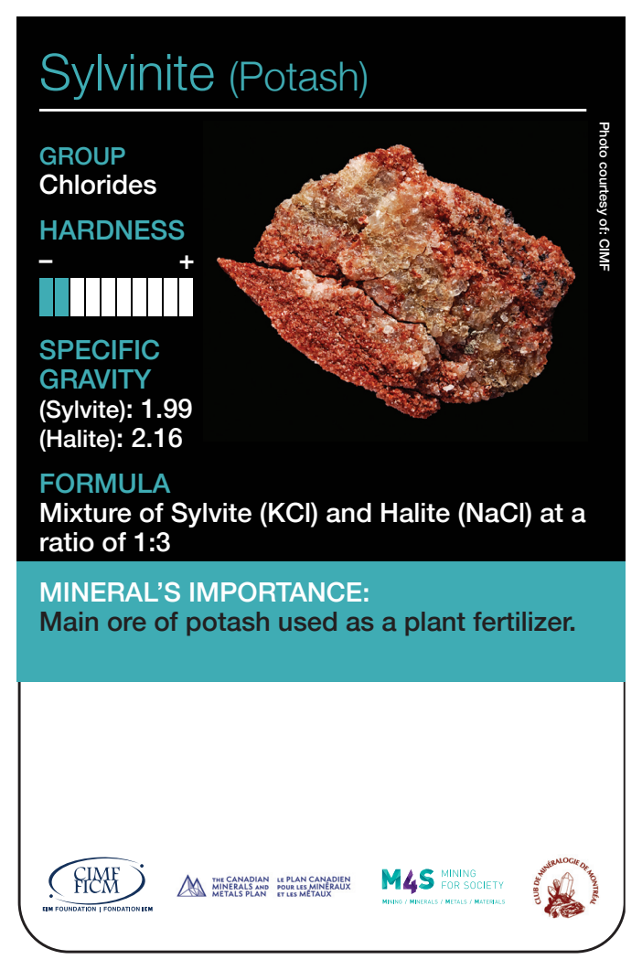
HARDNESS

SPECIFIC GRAVITY
4.63

FORMULA
Sb_2S_3

Photo and collection :
Ministère des Ressources naturelles et de la Faune

MINERAL'S IMPORTANCE:
Used for eye cosmetics, soldering alloy.



Sylvinite (Potash)

GROUP
Chlorides

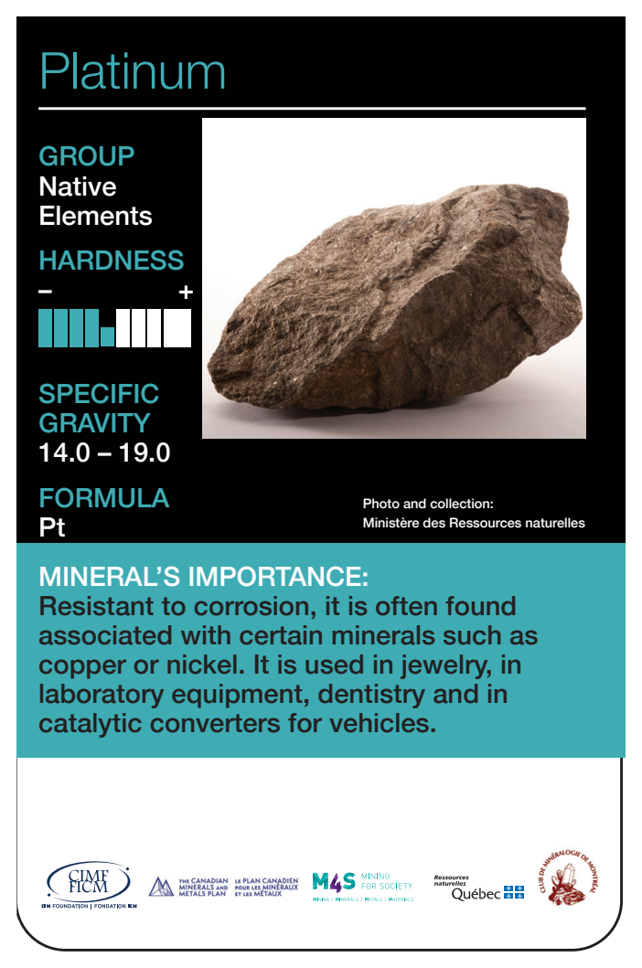
HARDNESS

SPECIFIC GRAVITY
(Sylvite): 1.99
(Halite): 2.16

FORMULA
Mixture of Sylvite (KCl) and Halite (NaCl) at a ratio of 1:3

Photo courtesy of: CIMF

MINERAL'S IMPORTANCE:
Main ore of potash used as a plant fertilizer.



Platinum

GROUP
Native Elements

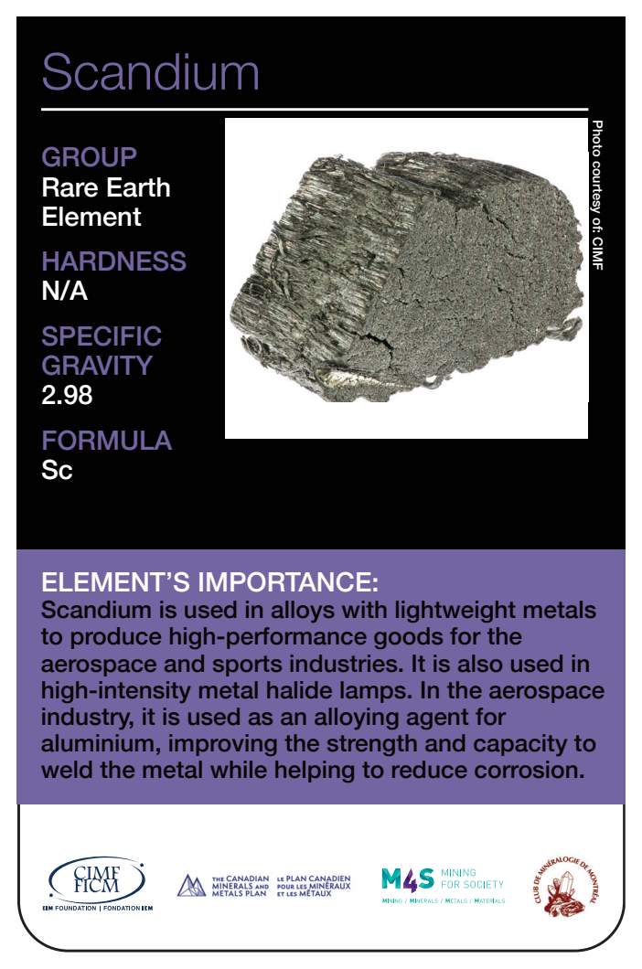
HARDNESS

SPECIFIC GRAVITY
14.0 – 19.0

FORMULA
Pt

Photo and collection:
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
Resistant to corrosion, it is often found associated with certain minerals such as copper or nickel. It is used in jewelry, in laboratory equipment, dentistry and in catalytic converters for vehicles.



Scandium

GROUP
Rare Earth Element

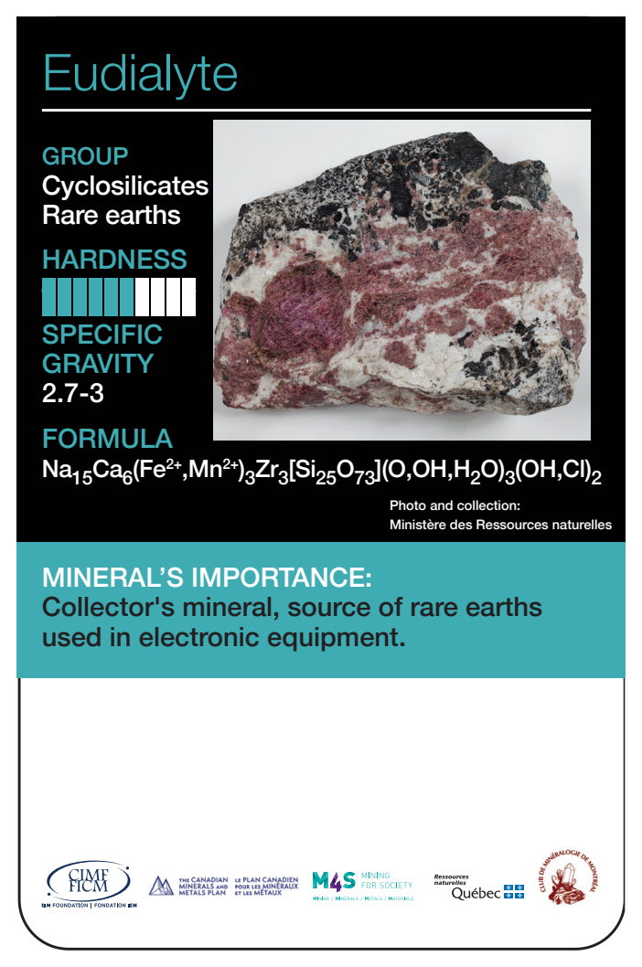
HARDNESS
N/A

SPECIFIC GRAVITY
2.98

FORMULA
Sc

Photo courtesy of: CIMF

ELEMENT'S IMPORTANCE:
Scandium is used in alloys with lightweight metals to produce high-performance goods for the aerospace and sports industries. It is also used in high-intensity metal halide lamps. In the aerospace industry, it is used as an alloying agent for aluminium, improving the strength and capacity to weld the metal while helping to reduce corrosion.



Eudialyte

GROUP
Cyclosilicates
Rare earths

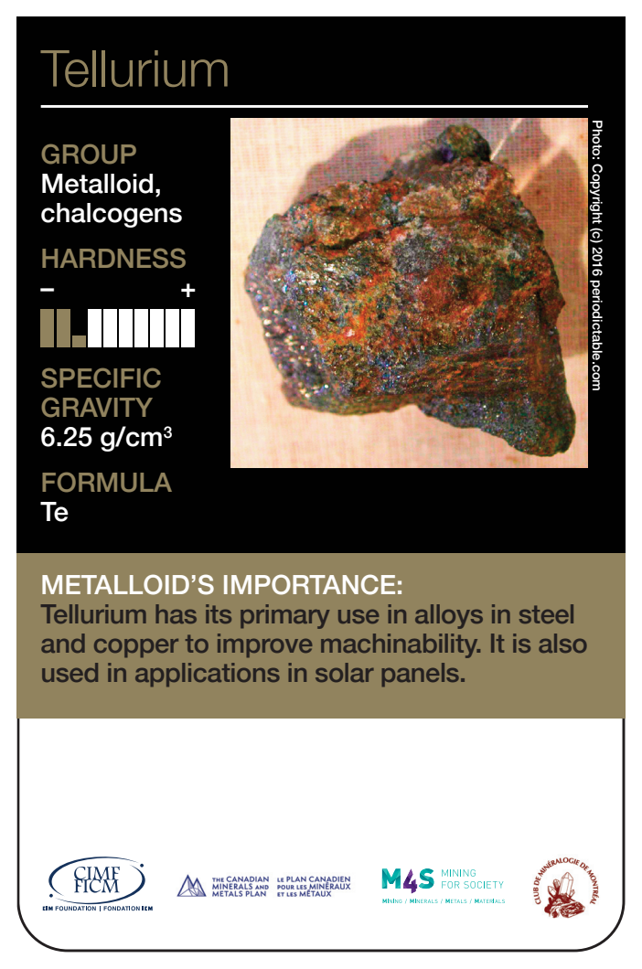
HARDNESS

SPECIFIC GRAVITY
2.7-3

FORMULA
$Na_{15}Ca_6(Fe^{2+},Mn^{2+})_3Zr_3[Si_{25}O_{73}](O,OH,H_2O)_3(OH,Cl)_2$

Photo and collection:
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
Collector's mineral, source of rare earths used in electronic equipment.



Tellurium

GROUP
Metalloid, chalcogens

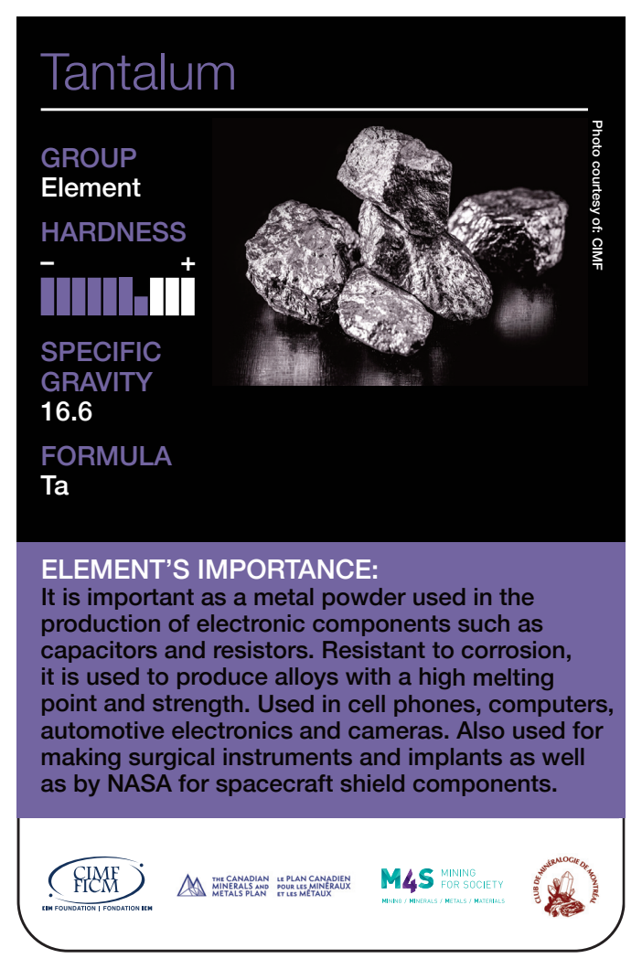
HARDNESS

SPECIFIC GRAVITY
6.25 g/cm³

FORMULA
Te

Photo: Copyright (c) 2016 periodictable.com

METALLOID'S IMPORTANCE:
Tellurium has its primary use in alloys in steel and copper to improve machinability. It is also used in applications in solar panels.



Tantalum

GROUP
Element

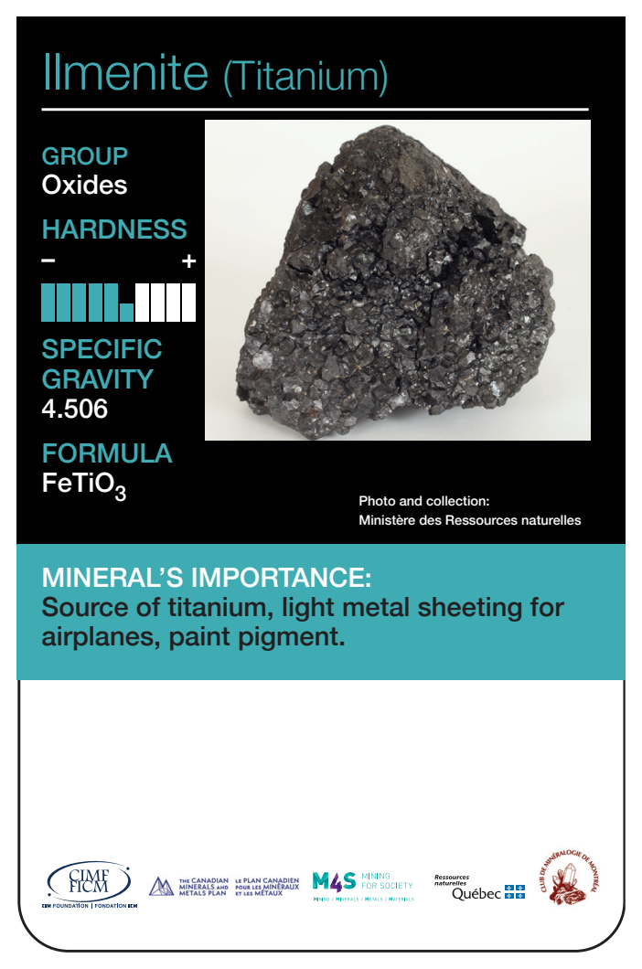
HARDNESS

SPECIFIC GRAVITY
16.6

FORMULA
Ta

Photo courtesy of: CIMF

ELEMENT'S IMPORTANCE:
It is important as a metal powder used in the production of electronic components such as capacitors and resistors. Resistant to corrosion, it is used to produce alloys with a high melting point and strength. Used in cell phones, computers, automotive electronics and cameras. Also used for making surgical instruments and implants as well as by NASA for spacecraft shield components.



Ilmenite (Titanium)

GROUP
Oxides

HARDNESS

SPECIFIC GRAVITY
4.506

FORMULA
$FeTiO_3$

Photo and collection:
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
Source of titanium, light metal sheeting for airplanes, paint pigment.

Cassiterite (Tin)

GROUP
Oxides

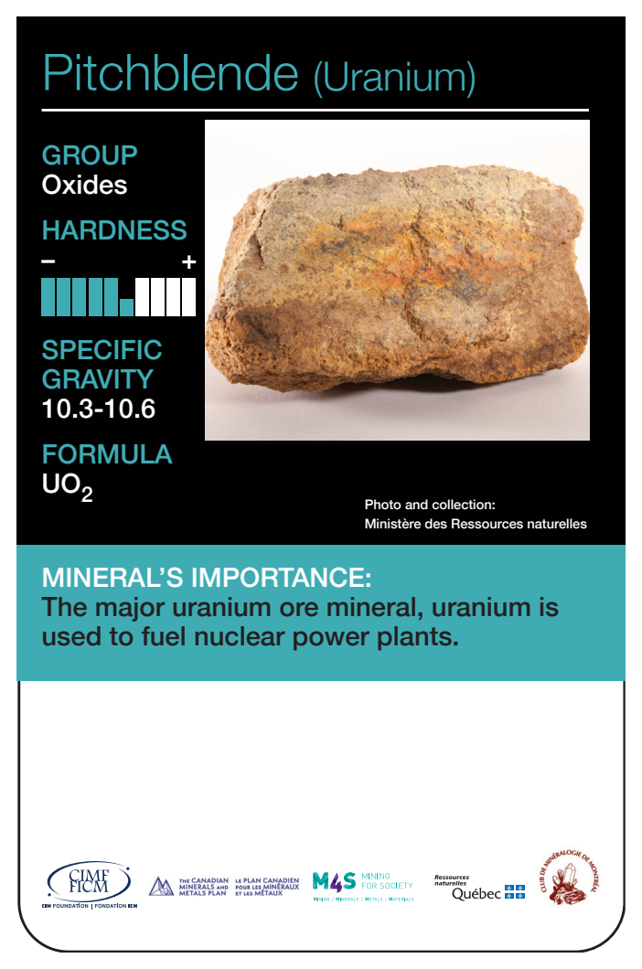
HARDNESS

SPECIFIC GRAVITY
6.98- 7.1

FORMULA
SnO_2

Photo courtesy of: CIMF

MINERAL'S IMPORTANCE:
Important source of tin (cans, roofing); produces bronze when alloyed with copper.



Pitchblende (Uranium)

GROUP
Oxides

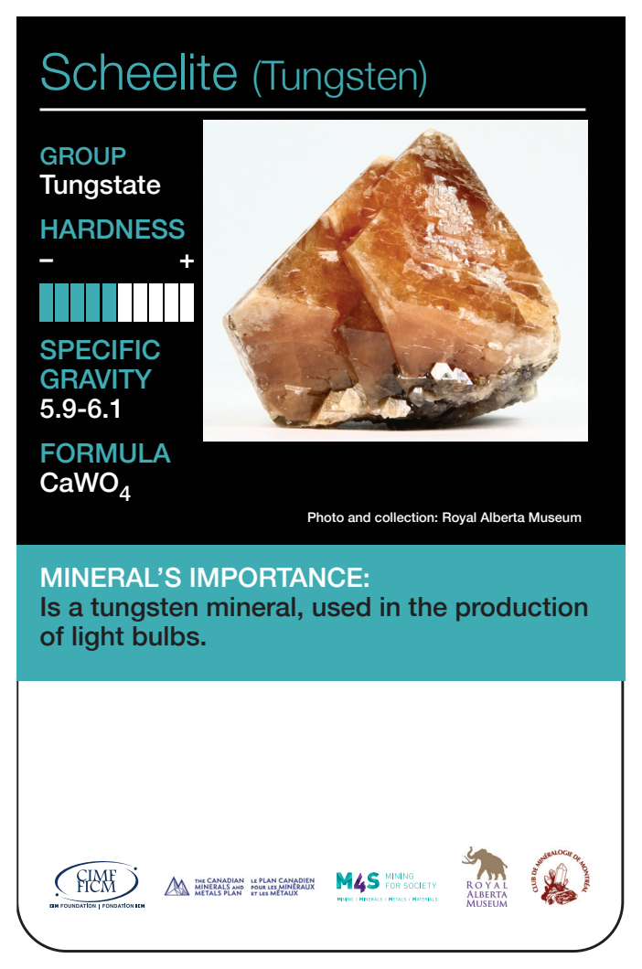
HARDNESS

SPECIFIC GRAVITY
10.3-10.6

FORMULA
UO_2

Photo and collection:
Ministère des Ressources naturelles

MINERAL'S IMPORTANCE:
The major uranium ore mineral, uranium is used to fuel nuclear power plants.



Scheelite (Tungsten)

GROUP
Tungstate

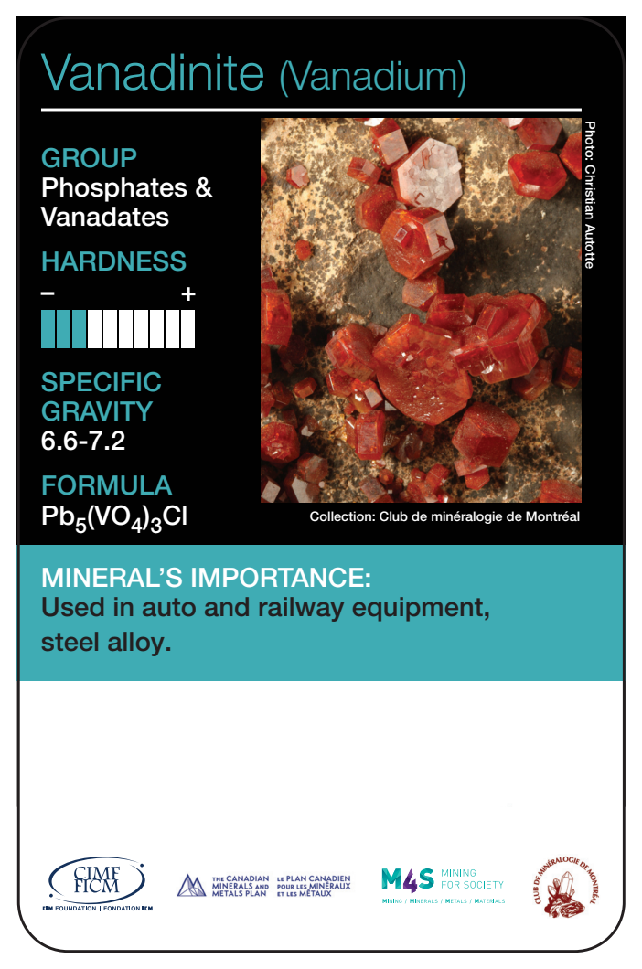
HARDNESS

SPECIFIC GRAVITY
5.9-6.1

FORMULA
$CaWO_4$

Photo and collection: Royal Alberta Museum

MINERAL'S IMPORTANCE:
Is a tungsten mineral, used in the production of light bulbs.



Vanadinite (Vanadium)

GROUP
Phosphates & Vanadates

HARDNESS

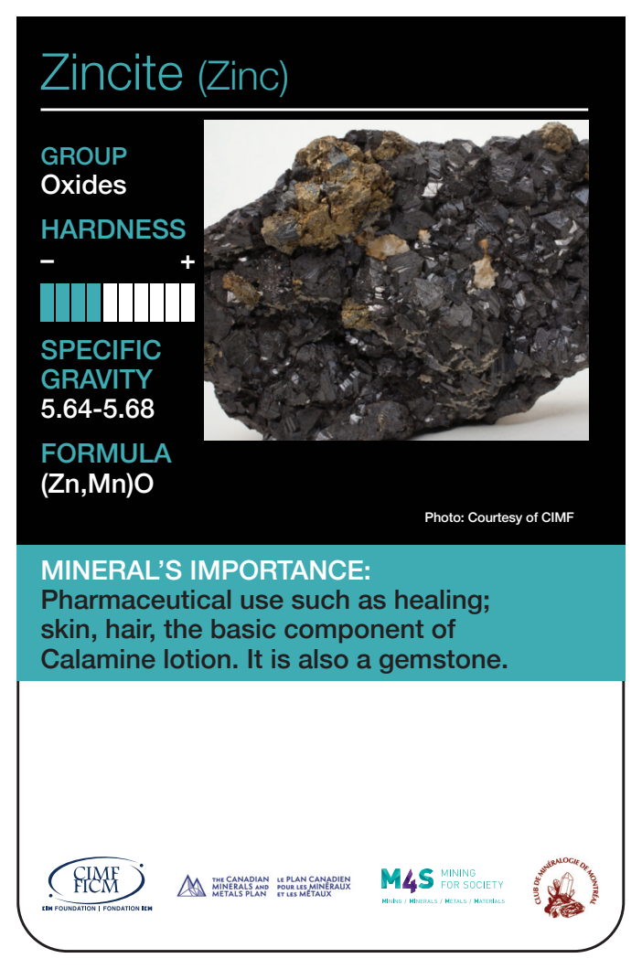
SPECIFIC GRAVITY
6.6-7.2

FORMULA
$Pb_5(VO_4)_3Cl$

Photo: Christian Autotte

Collection: Club de minéralogie de Montréal

MINERAL'S IMPORTANCE:
Used in auto and railway equipment, steel alloy.



Zincite (Zinc)

GROUP
Oxides

HARDNESS

SPECIFIC GRAVITY
5.64-5.68

FORMULA
(Zn,Mn)O

Photo: Courtesy of CIMF

MINERAL'S IMPORTANCE:
Pharmaceutical use such as healing; skin, hair, the basic component of Calamine lotion. It is also a gemstone.