MEDICINE UP FROM THE GROUND

ᐊᑭᑲᒃ ᐅᓇᒋᒪᑲᓇ ᒪᖅᑭᑭ

English and Ojibway

From head to toe, skin to bone, brain to heart, the human body is made up of complex systems.

ᐅᑎᑦᑲᓂᒃ ᐱᓂᖅ ᐃᐃᒪ ᓂᓯᑭᓯᑕᓇ, ᐅᖃᒃᑲᒃ ᑲᓇ ᐅᑲᓇ, ᑦᐃᓇᑎᑉ ᑲᓇ ᒥᒐᐃ, ᐯᒪᑎᓱᒃ ᐅᑦᐃᔭᑦ ᐸᑎᑦᓂᒃ ᐃᓇᓄᑭᒪᑲᓂ.

Learning about them, looking after them, and enhancing them has challenged the health community since the dawn of medicine. Ancient healing practices, modern medicine, and tomorrow's discoveries rely on natural resources. The Earth supplies us with the metals and minerals that contain many of the components for our wellbeing. Canada produces more than 60 minerals and metals, many of them necessary to the world of medicine.

ᐅᑲᑫᑭᑭᑲᒐᑭᓇ, ᐅᑲᐅᑕᑦᑲᑭᓇ ᑲᓇ ᑫᑭᐅᒋᒥᓄᐊᓄᑭᒪᑲᑭᓇ ᒋᐱᒥᓴᓇᑭᐃᑦᐅᒪᑲᓇ ᒋᐅᒋᒥᓄᔭᓂᑦᑲ ᑦᐅᑎ ᐱᑯ ᓂᑕᒻ ᑲᐱᐅᖅᑭᐊᐸᑕᓇ ᒪᖅᑭᑭ. ᒥᐅᓴ ᑲᑭᐱᐅᒋᑲᒐᑲ ᐊᓇᑕᑦᐃᐃᑦᐅᑦᐃᓇ, ᓄᑯᒻ ᑲᑭᓂᑲᑲ ᐅᐊᐸᑕᑲ ᒪᖅᑭᑭ ᒥᓇᐊ ᑦᐊᐸᑲ ᑫᓂᐊᐸᒋᒋᑲᒐᑭᓇ ᓇᓇᑕᑦᐃᑭᑫᑦᐃᓇᓇ ᐊᑭᑲᑲ ᑫᑯᓇᓇ ᑲᐅᓇᒋᒪᑭᓇ. ᐊᑭᑲᑲ ᑫᑯᓇᓇ ᑲᑕᑦᑲᑭᓇ ᑭᐳᑎᓂᑫᒥᓇ ᐱᑦᐊᐱᑯᓇ ᑲᓇ ᐊᓯᓂᑲ ᑲᑕᑦᑲᑭᓇ ᐸᑎᓇ ᑫᑯᓇᓇ ᑲᑦᐃᑐᑲᑯᓇ ᒋᒥᓄᐱᒪᑎᓯᓴᑲ. ᑲᓇᑕ ᐊᑭᑲ ᐅᒋᐅᐱᒋᑲᒐᑦᐊᓇ ᐊᑦᐊᐱᒥ 60 ᐊᓯᓂᑲᑲ ᑫᑯᓇᓇ ᑲᓇ ᐱᑦᐊᐱᑯᓇ, ᐸᑎᓇ ᐃᐃᒪ ᐅᓇᒋᐅᐱᒋᑲᒐᑦᐊᓇ ᒪᖅᑭᑭᓇ.

Mining Makes It Happen!
ᐱᑦᐊᐱᑯᑦᐃᓂᑲ ᐅᒋᐊᓄᑭᒪᑲᓄᓇ ᑫᑯᓇᓇ!

medical DEVICES
ᒪᖅᑭᑭᑦᐃ ᐊᐸᒋᑕᑲᓇᓇ

A medical office or a hospital features countless medical devices, tools, and machines made of metals and minerals, from needles and stethoscopes to sophisticated machines that look inside the body, without cutting, to examine bones, organs, and soft tissues.

- Surgical theatres and tools gleam with medical-grade stainless steel.
- Solid-state lasers, using Rare Earth Elements (REEs) holmium and thulium, make minimally invasive surgery possible.
- Orthopaedic implants allow people to regain normal function, thanks to stainless steel, titanium, and titanium alloys.

ᒪᖅᑭᑭᑦᐃᑲᒥᑯᓇ ᐊᔭᑦᐊᓇ ᐯᐸᑲᓇ ᒪᖅᑭᑭᑦᐃ ᐊᐸᒋᑕᑲᓇᓇ ᑲᓇ ᑲᐱᒥᐱᒐᑭᓇ ᑲᑭᐅᒋᐅᔪᒋᑦᑲᒐᑭᓇ ᐱᑦᐊᐱᑯᑦ ᑲᓇ ᐊᓯᓂᑲᑦ, ᑕᐱᖅᑯ ᓴᐳᓂᑲᓇᓇ, ᐊᓇᑐᑕᒧᓂᔭᐸ ᑲᓇ ᑯᑕᑭᔭᓇ ᑲᒪᒪᑲᒋᐊᓄᑭᒪᑲᑭᓇ ᑲᐃᓇᐱᓇᓂᑦᐊᑦ ᐱᓇᒋ ᒥᔭᐃᑦ, ᑲᑦᐃᓇ ᒐᑯᒻ ᓄᑯᒻ ᒋᒪᒋᑦᓴᑲᓂᐃᒻ ᐊᑦᐃᔭ, ᐅᑲᓂᑦ ᑲᐃᓯᓇᑲᒋᐊᑲᓂᐃᒻ, ᐱᓇᒋ ᑦᐃᔭᑦᐃᑦ ᑲᓇ ᑦᐃᔭᓯᑦ.

- ᒪᒋᓇᑦᐅᑦᐃᑲᒥᑯᓇ ᑲᓇ ᒪᒋᓇᑦᐅᑦᐃ ᐊᐸᒋᑕᑲᓇᓇ ᑦᐊᓯᑦᑲᐊᑲᑦᐊᓇ ᑲᑭᐅᒋᐅᔪᒋᑦᑲᒐᑭᓇ ᐊᐱᒋ ᑲᑦᐅᓂᔪᓂᑦ ᑦᐊᖓᐊᐱᑯᑦ.
- ᑲᒪᖅᑦᐊᓯᑫᒪᑲᑭᓇ ᒐᑦᓯᑲᓇ, ᑲᑦᐊᐸᑕᑦ ᐊᐱᒋ ᑲᔭᒪᑲᑭᓇ ᐊᑭᑦ ᑲᐅᒋᒪᑲᑭᓇ ᑫᑯᓇᓇ (REEs) ᐅᓕᔭᒪ ᑲᓇ ᑐᓕᔭᒪ, ᑲᑦᐃᓇ ᑕᖅ ᐊᐱᒋ ᓂᐱᑦᐊ ᐊᑦᐃᔭ ᒋᒪᒋᑦᓴᑲᓂᑦᐃᒻ ᐅᐅᑦᐅ ᑲᐊᐸᑕᑦ.
- ᐅᑲᓂᑦ ᑲᐱᑯᖅᑲᒻ ᑲᑦᐊᑦᐅᒋᒋᑲᒐᓂᑦ ᐅᑦᐃᒋᐃᑯᓇ, ᑲᐊᐸᑕᒋᓇ ᑦᐊᖓᐊᐱᑦ, ᑕᔾᒐᓂᔭᒪ ᑲᓇ ᑕᔾᒐᓂᔭᒪ ᐱᑦᐊᐱᑯᒋᑲᓇ.

With new discoveries, innovation, and material science, the list goes on!
ᐅᖅᑭ ᑫᑯᓇᓇ ᑲᓂᑭᑫᑦᒋᑲᒐᑭᓇ, ᑲᓂᐅᒋᒋᑲᒐᑭᓇ ᑲᑭᓇ ᑲᐊᓂᐃᒋᓇᑯᒋᑲᒐᑭᓇ ᑫᑯᓇᓇ, ᑲᑦᐃᓇ ᐃᖅᑲᓴᓯᓇ ᑫᑯᓇᓇ ᑫᓂᐅᒋᒋᑲᒐᑭᓇ!

Diagnosis
ᑲᑦᐃᓇᒋᑲᒐᑲ ᐊᓂᓇ ᐅᐃᓇᐱᓂᒃ

Mineral elements are often used to help diagnose a patient's condition, whether in conjunction with medical devices to show a picture of the body's internal function or in medical research.

A magnetic resonance imaging (MRI) machine detects contrast agents, injected into patients to make certain tissues, abnormalities, or disease processes more clearly visible. Contrast agents include manganese-, iron-, and gadolinium-based substances.

X-ray machines detect technetium-99m, derived from decaying uranium, and the most commonly used isotope in nuclear medicine, to reveal brain, heart, and bone abnormalities.

ᐊᓯᓂᑲᒃ ᑲᐅᓇᒋᒪᑲᑭᓇ ᑫᑯᓇᓇ ᐊᐸᒋᒋᑲᒐᑦᐊᓇ ᒋᐅᓇᒋ ᑭᑫᓇᑕᑦᑲᓂᒃ ᐅᑕᑯᓯ ᑲᐃᓇᐱᓂᒃ, ᑕᐱᖅᑯ ᑯᑕᑭᔭᓇ ᑲᑕᑯᐊᐸᑕᑭᓇ ᒪᖅᑭᑭᑦᐃ ᐊᐸᒋᑕᑲᓇᓇ ᑫᐅᒋ ᐊᐸᑦᐊᒋᑦᑲᒐᑭᓇ ᐱᓇᒋᒥᔭᑦᐃᒃ ᑲᐃᓇᐱᓇᑦᑲᓂᒃ ᑫᒪ ᒪᖅᑭᑭᑦᐃ ᐊᓇᑕᑦᐃᑭᑫᑦᐃᓂᒃ.

ᒪᒪᑲᑕᐱᒃ ᓴᑦᐸᒐᓯᒋᑲᓇ (MRI) ᑦᐊᐸᓇᒋᑫᒪᑲᓇ ᑫᑯᓇᓇ, ᓇᑦᑲᓇ ᐊᓂᓇ ᐅᓂᓇᑦᑲᒃ ᑦᐃᔭᓯᒃ, ᑫᑯᓇᓇ ᑲᓂᑕᑦᐃᑭᒪᑲᑭᓇ ᑫᒪ ᐊᑯᓯᑦᐃᓇ ᑲᓇᓇᑕᑦᐊᐸᒋᑲᒐᒃ ᐸᔭᒐᓇᑦᑲᓇ. ᐅᓄ ᐊᐸᑕᓄᓇ ᑲᑦᐅᒋᐊᓄᑭᒪᑲᒃ ᓴᑦᐸᒐᓯᒋᑲᓇ ᒪᓇᑲᓂᔭ, ᑲᑯᓯᑦᑲᐱᑲᒃ ᐱᑦᐊᐱᒃ ᑲᓇ ᑲᑐᓕᓇᔭᒪ ᐱᑦᐊᐱᑯᒋᑲᓇᓇ.

ᑯᑕᑭᔭᓇ ᑎᓄ ᓴᑦᐸᒐᓯᒋᑲᓇᓇ ᑲᑦᐅᒋᐅᓂᒋᑲᒐᑭᓇ ᐱᑦᐊᐱᒃ ᒐᑦᑲᓂᑎᔭᒪ - 99, ᐅᓇᑎᓂᑲᒐ ᑲᓂᓂᑦᐊᓇᑕᒃ ᔪᕋᓇᔭᒪ, ᑲᓇ ᒥᐃᑦᐅ ᑲᓂᑕᐊᐸᑕᒃ ᐊᔾᓯᑦᐳᑉ ᑲᒐᑭᓯᑫᒪᑲᑭᓇ ᒪᖅᑭᑭ, ᑲᓇᓇᑲᒋᒋᑲᒐᑭᓇ ᑲᐃᓂᐊᓯᓇᓂᑦᐊᑦᐃᓇᑎᐱᒃ, ᐅᒐᐃᑦ ᑲᓇ ᐅᑲᓂᑦ.

BODY IN BALANCE
ᑦᐅᑦᐅᓂ ᑲᐅᒋᒥᓄᔭᒪᑲᑦ ᒥᔭᑦ

The human body is 96 per cent made up of six elements: oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus.

ᐯᒪᑎᓯᒃ ᐅᑦᐃᔭᑦ ᑫᑲ ᒥᓯᑦᐅ 96% ᑕᑦᑲᓂ ᐅᓄ ᑫᑯᓇᓇ: ᐸᑭᑕᓇᒧᑦᐃᓇ, ᑲᕐᐱᓇ, ᐊᒃᑕᑭᒋᓇ ᑲᕐ, ᓇᒃᑲᑭᒋᓇ ᑲᕐ, ᑲᓇᓯᔭᒪ ᑲᓇ ᑦᐸᑦᐸᕋᕐ.

The remaining 4% comprises trace elements essential to various functions. All of these elements and more are found in Earth's four spheres—lithosphere, atmosphere, hydrosphere, and biosphere—where they combine in different ways and continually cycle between the spheres.

ᒥᓇᑦᐊ ᕋᔭᐱ 4% ᑕᑦᑲᓄᓇ ᑫᑯᓇᓇ ᑲᐅᒋᑦᐃᒋᐃᑦᐅᒪᑲᑦ ᒥᔭᑦᐃᑦ. ᑲᑭᓇ ᐅᓄ ᑫᑯᓇᓇ ᑲᓇ ᑯᑕᑭᔭᓇ ᑕᑦᑲᓄᓇ ᐊᑭᑲᑦ ᓂᑦᐊᓇᑦ ᑲᐅᒋᒪᒪᑦᐃ ᑦᐃᑕᓄᑭᒥᑎᒪᑲᑭᓇ - ᑦᐊᑭᑕᑲᒥᑦ, ᐃᖅᐱᒥᑦ, ᓂᐱ ᑲᓇ ᑎᑎᐸᑲᒥᑦ - ᑲᐅᒋᒪᒪᑦᐃ ᐊᓄᑭᒪᑲᑭᓇ ᓴᑯᑦ ᐃᑕᖅ ᐯᐸᑲᓇ ᐃᓱᐱᒥᐊᓄᑭᒪᑲᓄᓇ ᑲᓂᐱᒥ ᒪᒥᖅᑦᑲᑕᓄᑭᒪᑲᑭᓇ.

As part of that cycle, we take in and release our delicately balanced combination of elements; depletion or imbalance causes our systems to suffer. To achieve that balance, we must eat nutritious food, whether animal or vegetable in origin, supported by mineral-rich soil. Where elements are missing, we turn to other sources.

ᐅᐅᑦᑲ ᑲᐃᓱᐱᒥᐊᓄᑭᒪᑲᑦ, ᑭᑕᐸᒋᑐᒥᓇ ᑲᓇ ᑭᑕᓂᑦᐅᐱᓇᒥᓇ ᑲᑦᐊᑫᑦᐃᓇᑦᑲᑭᓇ ᑲᐅᒋᒪᒪᑦᐃ ᐊᓄᑭᒪᑲᑭᓇ ᑫᑯᓇᓇ, ᒐᑭᓂᑫᑦᐃᓇ ᑫᒪ ᐊᐸᓇ ᑦᐅᑦᐅᓂ ᑲᐊᓄᑭᒪᑲᓯᓄᑦ ᑭᑕᓂᐊᑯᓯᖅᑲᑯᒥᓇ. ᒥᑕᖅ ᕿᐅᒋ ᒥᓄᐊᓄᑭᒪᑲᑦ ᑭᔭᐃᓇᓇ, ᒋᒥᒋᔭᑦ ᑲᑭᓯᓴᑦᐃᖅᑫᒪᑲᑭᓇ ᒥᒋᒪᓇ, ᑕᐱᖅᑯ ᐊᐊᑦᐃᖅ ᕿᒪ ᑭᑎᑲᓇ, ᑲᑭᐅᒋ ᑲᑕᑦᐃᑭᒪᑲᑭᓇ ᑲᐃᓱᐅᓂᓱᓂᑦ ᐊᓱᖅᑭ. ᑭᖅᐱᓇ ᐊᔭᒪᑲᓯᓄᑭᓇ, ᐸᑲᓇ ᑭᑎᓱᓇᓇᑕᑦᐊᐸᒋᑫᒥᓇ.

a different approach to HEALING
ᐯᐸᑲᓇ ᑲᑐᒋᑲᒐᑭᓇ ᐊᓇᑕᑦᐃᐃᑦᐅᑦᐃᓇ

Traditional western medicine has found numerous uses of metals and minerals, but alternative medicine suggests other approaches.

In Hinduism, crystals such as azurite, kyanite, ruby, and amethyst are believed to balance and amplify a person's energy, and placing crystals on energy focal points on the body, or chakras, is believed to promote healing.

Copper and iron figure largely in modern medicine, but many people use them in alternative approaches, believing that wearing copper relieves arthritis and wearing magnets alleviates pain and other health concerns.

Indigenous cultures have long used the healing powers of mud, rich with clay minerals. In Canada, the Heiltsuk First Nation has used mineral-rich clays for centuries for both external and internal medicine. Natural medicine today suggests bentonite clay, made up of weathered volcanic ash, for many internal and external uses.

ᓂᑕᒻ ᑦᐅᒥᑎᑯᓂᒃ ᒪᖅᑭᑭ ᑲᑦᐊᓇᑕᑦᐃᐅᑦᐊᑫᓇᓂᑦᐊᑦ ᐅᓇᒋᑦᐊᓇ ᐱᑦᐊᐱᑯᑦ ᑲᑦ ᐊᓯᓂᑲᑦ, ᑯᑕᑭᔭᓇ ᐃᑕᖅ ᐯᐸᑲᓇ ᑲᑐᒋᑲᒐᑭᓇ ᐊᓇᑕᑦᐃᐃᑦᐅᑦᐃᓇᓇ ᐊᐸᒋᒋᑲᒐᑦᐊᓇ.

ᐃᓇᑐᐃᓯᒻ ᑲᐃᒋᑲᒐᑦ ᐊᑲᒪᑭᑦ, ᑦᐊᔾᑐᑦ ᑕᐱᖅᑯ ᐊᓇᕐᔭᑦᑕ, ᑲᔭᓇᑦᑕ, ᑭᐱ ᑲᑦ ᐊᒥᑎᑦᑕ ᐊᓯᓂᑲ ᑲᓂᑦᐸᒐᓯᑦᐊᑦ ᐸᑎᓇᑦᐊᑦ ᐅᓇᒋᑦᐊᓇ ᐱᑦᐊᐱᑯᑦ ᑲᑦ ᐊᒥᑎᑦᑕ ᐊᓯᓂᑲᑦ, ᑕᐱᖅᑯ ᓱᑎᔭᒪ ᑲᑦᑕᕐᔭᑦ (NaF)

ᐅᓇᑐᐃᓯᒻ ᑲᐃᒋᑲᒐᑦ ᐊᑲᒪᑭᑦ, ᑭᑕᐸᒋᑐᒥᓇ ᑲᑦᐊᓇᑕᑦᐃᐃᑦᐅᑦᐃᓇᓇ ᐊᐸᒋᒋᑲᒐᑦᐊᓇ. ᑕᐱᖅᑯ ᓱᑎᔭᒪ ᑲᑦᑕᕐᔭᑦ (NaCl)

Native copper
ᑲᐅᓱᐅᒪᑲᑦ ᐅᓴᐊᑦ

Quartz/Amethyst
ᓴᑦᕐᑦ / ᐊᒥᑎᑦᑕ

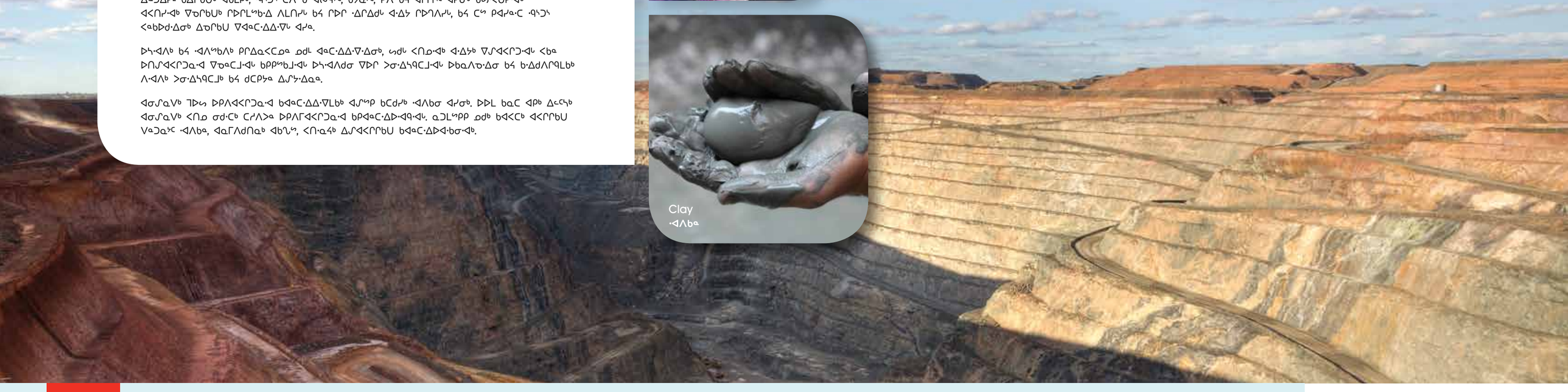
Clay
ᑦᐊᐱᑲᓇ

Stainless Steel
ᑲᑦᐊᖓᐊᐱᑲᑦ ᐱᑦᐊᐱᑦ

The alloy of iron with chromium, nickel, and molybdenum, sometimes called surgical stainless steel, plays a key role in medical applications. Its high corrosion resistance, strength, precision, reliability, and antibacterial properties meet the stringent standards for surgical tools, from scalpels, and trays to sinks and operating tables. Sensor probes, ear scope nozzles, and catheters add to the list of uses.

ᒪᒪᑦᐊᑲᒥᓂᑲᒐᑦᐊᓇ ᐱᑦᐊᐱᑦ ᑲᓗᒥᔭᒪ, ᑦᐊᐱᖅᑭᓇᓂᔭ ᑲᑦ ᑦᒪᓕᑦᐸᒐᓇᒪ, ᐅᖅᑲᒪ ᐃᓱᓂᑲᒐ ᑲᒪᖅᑲᑦᐊᐱᑲᑦ ᐱᑦᐊᐱᑦ, ᑭᒋᓇᐸᑕᓇ ᒪᖅᑭᑭᑦᐃ ᐊᐸᒋᒋᑫᑦᐃᓂᑦ. ᑲᑦᐃᓇ ᒋᑦᐊᑫ ᐱᑦᑲᐱᑭᖅᑲᒪᑭᑦ, ᒪᖅᑲᑦᐊᐱᑲᓇ, ᑭᒋᓇᐸᑕᓇ ᑲᑦ ᑲᑦᐃᓇ ᒋᐊᑦᑲᐱᑭᒪᑲᑦ ᑲᒪᓱᑐᒋᑫᒪᑭᓇ ᑫᑯᓇᓇ ᒥᑕᖅ ᐃᐃᒪ ᑲᑦᑭᑦ ᐅᓱᒋᑦᑲᒐᑭᓇ ᒪᒋᓇᑦᐅᑦ ᑲᑦᐊᓇᑕᑦᐊᐸᒋᑲᓇᓇ, ᑲᑦ ᑲᑦᐅᑦᐅᒋᑦᑲᒐᑭᓇ ᐊᓇᑐᑭᒋᑲᓇᐱᑯᓇ ᑲᑦ ᑲᑦᐃᑯᐱᒋᑫᒪᑲᑦ ᐱᑦᐊᐱᑦ ᐳᓂᑦᐃᔭᑦᐊᐱᑦ ᑲᑦ ᑯᑕᑭᔭᓇ ᐃᓱᔭᑦᐃᓇᓇ.

ᐊᓂᓱᓇᐯᑦ ᒥᐅᔪ ᐅᑭᐱᐊᐸᒋᑐᓇᑦᐊ ᑲᑦᐊᓇᑕᑦᐃᐃᑦᐅᒪᑲᑦ ᐊᓱᖅᑭ ᑲᑕᑯᓯᑦ ᑦᐊᐱᑲᓂ ᐊᓯᓂᑲ. ᐅᐅᒪ ᑲᓇᑕ ᐊᑭᑦ ᐃᓪᓕᔭᑦ ᐊᓂᓱᓇᐯᑦ ᐸᑎᓄ ᓂᑯᑦᑕᑦ ᑕᓯᐱᐳᓇ ᐅᑭᐱᒥᐊᐸᒋᑐᓇᑦᐊ ᑲᑭᐊᓇᑕᑦᐃᐅᑦᐊᑫᑦᐊᑦ. ᓇᑐᒪᖅᑭᑭ ᓄᑯᑦ ᑲᑦᐊᐸᑦ ᐊᐸᒋᒋᑲᒐᑦ ᐯᓇᑐᓇᔭᑦ ᑦᐊᐱᑲᓇ, ᐊᓇᒥᐱᑯᑎᓇᑦ ᐊᑲᖓᖅ, ᐸᑎᑦᓇᔭᑦ ᐃᓱᐊᐸᒋᒋᑲᒐᑦ ᑲᑦᐊᓇᑕᑦᐃᐅᑦᐊᑦᑲᓂᑦᐊᑦ.



KEY TERMS
ᒪᔭ ᑦᐃᓇᒋᑫᑦᐃᓇᓇ

A **PURE SUBSTANCE** consists of matter that comprises only one type of particle and that can be classified as either an element or a compound. E.g., **Gold (Au), Oxygen (O_2), and water (H_2O)**

ᑲᐯᑲᑦ ᑫᑯᓇ ᑲᑭᑭᓯᓇᑦ ᐯᓱᑦ ᐅᑕ ᑫᑯᓇ ᐃᐃᒪ ᐊᔭᒪᑲᓇ. ᑕᐱᖅᑯ ᐅᓴᐊᑦᐃᓂᔭᑦᐊᐱᑦ (Au), ᐸᑭᑕᓇᒧᑦᐃᓇ (O2), ᑲᓇ ᓂᐱ (H2O)

An **ELEMENT** is the simplest form of a pure substance; it cannot be broken down using chemical methods. E.g., **Copper (Cu)**

ᑫᑯᓇ ᑲᐊᔭᒪᑲᑦ ᑲᐯᑲᑦ, ᑲᑦᐃᓇ ᑕᑭᑕᑯᓂᑲᒐᓯᓄᓇ ᑯᑕᑦ ᑫᑯᓇ. ᑕᐱᖅᑯ ᐅᓴᐊᑦ (Cu)

A **COMPOUND** is a pure substance made up of two or more different elements chemically combined. E.g., **Sodium fluoride (NaF)**

ᑫᑯᓇ ᑲᐯᑲᑦ ᑫᑯᓇ ᑲᑭᑭᓯᓇᑭᓇ ᓂᐱᓇ ᑫᒪ ᓂᓯᓇ ᐸᑲᓇ ᑫᑯᓇᓇ. ᑕᐱᖅᑯ ᓱᑎᔭᒪ ᐸᑦᓕᕐᔭᑦ (NaF)

A **MINERAL** is a natural compound formed through geological processes; to be considered a "true" mineral, it must be solid, inorganic, and crystalline, with a defined chemical composition. E.g., **Sodium chloride (NaCl)**

ᐊᓯᓇ ᑲᑭᐅᒋᐅᓱᒋᐅᑦ ᐊᐱ ᑲᑭᒧᓇᐊᓯᓂᑦᐊᓯᑦ, ᒥᐊᑦᐅ ᒪᔭ ᑌᑦᐯ ᑲᐊᓯᓂᑦᐃᑦ, ᑲᒪᖅᑦᐃᓯᑦ, ᑫᑯᓇ ᑲᑭᑭᔭᒪᑲᓯᓄᑦ ᑲᓇ ᑲᓇᑦᐸᒐᓯᑦ ᑲᓇ ᑕᑭᒪᒪᑦᐃᓂᑲᒐ ᑯᑕᑦ ᑫᑯᓇ. ᑕᐱᖅᑯ ᓱᑎᔭᒪ ᑲᑦᕐᔭᑦ (NaCl)

A **MIXTURE** is a combination of two or more pure substances, in which each pure substance retains its individual chemical properties. E.g., **Alloy (steel)**

ᑲᑭᑭᓯᓇᑭᓇ ᓂᐱᓇ ᑫᒪ ᐊᑦᐊᐱᒥ ᑲᐯᑲᑭᓇ ᑫᑯᓇᓇ, ᐯᐱᑦ ᐃᐃᑦᐅ ᑲᑎᐱᓇᑦᐅᐊᔭᒪᑲᑦ ᑫᑯᓇ. ᑕᐱᖅᑯ ᑭᑭᓂᑲᒐᑭᓇ (ᐱᑦᐊᐱᑦ)

MiningMatters.ca

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ᐊᓂᑦ ᑲᓇᑕᒪᕋᐱᐃᑲᓇ ᑲᑭᐅᒋᐸᑭᑎᓂᑲᒐᑦ

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NATURAL RESOURCES
ᐊᑭᑲᒃ ᕿᑯᓇᓐ ᑲᔭᒪᑲᑭᓇ

LEGEND ᑭᑭᓇ·ᐊᒋᒋᑲᓇᓐ

Alkali metals | Alkaline earth metals | Actinides | Transition metals | Other metals | Non-metals

ᐊᓐᑲᓕ ᐱ·ᐊᐱᑯᓇ | ᐊᓐᑲᓕᓇ ᐊᑭᒃ ᐱ·ᐊᐱᑯᓇ | ᑲᓇᒋᐱᒋᕿᒪᑲᒃ ᐱ·ᐊᐱᑯᓇ | ᑲᐱᒥᐊᒋᓇ·ᑲᒃ ᐱ·ᐊᐱᑯᓇ | ᑯᑕᑭᔭᓇ ᐱ·ᐊᐱᑯᓇ | ᑲᐱ·ᐊᐱᑯ·ᐊᓯᓄᑭᓇ

ᐅᓚᔭᑦ

SODIUM (Na) *Atomic Number: 11*

Sodium, an essential element in the human body, is found in numerous minerals such as feldspars, sodalite, and halite. It helps maintain proper muscle and nerve function, stable blood pressure levels, and balance of water in and around cells.

ᓱᑎᔭᒪ (Na) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 11

ᓱᑎᔭᒪ, ᑭᒋᐃᓇᐸᑕᓇ ᐅᐅ·ᐅ ᒋᐊᔭᒪᑲᓂᒃ ᐊ·ᐃᔭ ᐅ·ᐃᔭ·ᐃᒃ, ᐅᓇᑎᓂᑲᒐ ᐯᐸᑲᓇ ᐊᓱᓂᒃ ᑕᐱᖁ ᐯᓚᕐᐸᕐ, ᓱᑕᓚᔭᑦ ᑲᓇ ᐅᓚᔭᑦ. ·ᐃᑐᑭᕿᒪᑲᓇ ·ᐅ·ᐅᓂ ᒋᐊᓄᑭᒪᑲᑭᓇ ᒪᖃ·ᐃ·ᐊᑭᓱ·ᐃᓂᒃ ᑲᓇ ᑲᐅᒋᓂᓱᑐᓱᓇᓂ·ᐊᒃ, ·ᐅ·ᐅᓂ ᒋᐊᓄᑭᒪᑲᒃ ᐸᓇᑲᐅᑯ·ᐃᓇ ᑲᓇ ᓂᐱ ᒐᒥᓂᒃ ᒋᐊᔭᒪᒃ ᐱᓇᒋ ᒥᔭᐃᒃ.

ᓱᓚᐸᔭᑦ

POTASSIUM (K) *Atomic Number: 19*

Potassium, an element available from potash sources such as the minerals sylvite and carnallite, is an electrolyte in the human body. It helps maintain proper function of all cells, tissues, and organs. It plays a key role in heart function, as well as skeletal and smooth muscle contraction. As an electrolyte, it conducts electricity in the body, along with sodium, chloride, calcium, and magnesium.

ᐳᑕᓱᔭᒪ (K) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 19

ᐳᑕᓱᔭᒪ, ᐅᓇᒋᒪᑲᓇ ᐊᑭᑲᒃ ᑕᐱᖁ ᐸᑕᕐ ᐊᓱᓂᒃ ᓱᓚᐸᔭᑦ ᑲᓇ ᑲᕋᓚᔭᑦ, ᐃᓇᓄᑭᒪᑲᓇ ᑕᐱᖁ ᐅᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᒃ ᒥᔭᒃ. ·ᐃᑐᑭᕿᒪᑲᓇ ·ᐅ·ᐅᓂ ᒋᐱᒪᓄᑭᒪᑲᑭᓇ ᑲᑭᓇ ᑲᑕᓱᔭᑭᓇ ᕿᓇᓇᑦᑲᒃ. ᑲᓇ ᐅᓇᒋ·ᐃᑐᑭᕿᒪᑲᓇ ᒥᐃᓄ ᒋᒥᓄᐊᓄᑭᒪᑲᒃ, ᑲᓇ ᐃᐃᒪ ᑭᑯᓇ ᒪᖃᑲ·ᐊᑭᓱ·ᐃᓂᒃ ᑲᓇ ᑲᐅᒋᓂᓱᑐᓱᓇᓂ·ᐊᒃ. ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ ᒥᓱ·ᐅ ᒥᔭᐃᒃ, ᑕᑯ ᐃᓂ ᓱᑎᔭᒪ, ᑲᓚᕐᔭᑦ, ᑲᓚᓱᔭᒪ ᑲᓇ ᒪᑲᓂᓱᔭᒪ.

ᓗᐱᑕᓚᔭᑦ

CESIUM (Cs) *Atomic Number: 55*

Cesium, a very rare element, occurs in granite pegmatites rich with the minerals pollucite and lepidolite. Its main biomedical use is the separation of deoxyribonucleic acid (DNA). Cesium chloride treats all forms of cancer and shows potential as an alternative cure.

ᓴᓴᓱᔭᒪ (Cs) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 55

ᓴᓴᓱᔭᒪ, ᑲ·ᐃᓇ ᐊᐱᒋ ᐊᔭᒪᑲᓱᓇᓇ, ᐅᓇᒋᒪᑲᓇ ᑲᐃᓱᐱᓴᑕ·ᐊᓇᑲᒃ ᐯᒃᒪᑕᔭᑦ ᑲᐃᓱᐊᓱᓂ·ᐊᒃ ᐸᓗᓴᔭᑦ ᑲᓇ ᓗᐱᑐᓚᔭᑦ. ᒪᔭ ᐃᓇᐸᑕᓇ ᐅᐅ·ᐅ ᑲᓇᓇᑲᒋᒋᑲᒐᒃ ᑲᑕ·ᑲᒃ ᐃᐃᒪ ᕿᑯᓇ ᑲᐅᓇᒋᑭᕿᑕ·ᑲᒃ (DNA) ᑲᐅᓇᒋᓇᓂ·ᐊᒃ. ᓴᓴᓱᔭᒪ ᑲᓚᕐᔭᑦ ᐊᐸᒋᒋᑲᒐ ᑲᐊᓇᑕ·ᐃᒋᑲᒐᒃ ᐯᐸᑲᓇ ᑲᐊᒧ·ᐅᒪᑲᑭᓇ ᐊᑯᓂ·ᐃᓇᓇ ᑲᓇ ᐊᐸᒋᒋᑲᒐ ᑲᐅᒋᐅᓱᒋᑲᒐᒃ ᓇᑐᒪᖃᑭ.

ᒋᐸᓴᒃ/ᓴᐳᓇᔭᑦ

CALCIUM (Ca) *Atomic Number: 20*

Calcium is obtained from the minerals calcite and gypsum, and from the rocks limestone, dolostone, and marble. Calcium is the fifth most common element in the human body; as a structural material, it occurs in cell walls, bones, and teeth. It plays a role in regulating the heartbeat and in blood clotting. Calcium supplements help maintain bone density as people age.

ᑲᓚᓱᔭᒪ (Ca) ᐊᑕ·ᒥᒃ ᐊᑭᑕᓱᓇ 20

ᑲᓚᓱᔭᒪ ᐅᓇᒋᒪᑲᓇ ᐊᓱᓂᒃ ᑲᓚᓴᔭᑦ ᑲᓇ ᒋᐸᓴᒃ, ᑲᓇ ᐃᐃᒪ ᐊᓇᒪᐱᒃ ᐊᓱᓂᒃ ᑕᐱᖁ ᓚᔭᓴᑐᓇ, ᑐᓴᑐᓇ ᑲᓇ ᒪᕐᐳ. ᐅᐅ·ᐅ ᑲᓚᓱᔭᒪ ᓇᓇᒃᑲᒃ ᑲᑕ·ᑲᒃ ᒥᔭᐃᒃ, ᑲᐅᒋᓱᑐᓂᕿᒪᑲᒃ, ᐃᐃᒪ ᐃᓱᐊᔭᒪᑲᓇ ᑎᑎᐸᐃ ᑲᐅᒋᒪᒋᑭᒃ ᐱᒪᑎᓱᐃᓇ, ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ ᑲᓇᐃᓇ ᑲᓇᒋᒋᑲᒐᒃ ᐊᓱᓂᒃ ᑕᐱᖁ ᐊᓱᓂᒃ ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ. ᐃᑐᑭᕿᒪᑲᓇ ᒋᓱᐊᔭᒪᑲᓇ ᑎᑎᐸᐃ ᑲᐅᒋᒪᒋᑭᒃ ᐱᒪᑎᓱᐃᓇ ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ. ᐃᑐᑭᕿᒪᑲᓇ ᑲᓇᐃᓇ ᑲᓇᒋᒋᑲᒐᒃ ᐊᓱᓂᒃ ᑕᐱᖁ ᐊᓱᓂᒃ ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ. ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ ᒋᓱᐅᒃ ᒥᔭᐃᒃ, ᑕᑯ ᐃᓂ ᓱᑎᔭᒪ, ᑲᓚᕐᔭᑦ, ᑲᓚᓱᔭᒪ ᑲᓇ ᒪᑲᓂᓱᔭᒪ.

ᐸᕋᔭᑦ

BARIUM (Ba) *Atomic Number: 56*

Barium, a soft silvery metal, comes primarily from the mineral barite. Barium is used as an X-ray radiocontrast agent for imaging the human gastrointestinal tract. Barite blocks X-ray and gamma-ray emissions; it is added to high-density concrete for radiation shielding around X-ray units in hospitals.

ᐯᓇᔭᒪ (Ba) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 56

ᐯᓇᔭᒪ, ᓄᓱᒃ ᐅ·ᐊᐱᖅᑲᒃ ᐱ·ᐊᐱᒃ, ᐅᓇᒋᒪᑲᓇ ᐊᓇᒪᑭᒃ. ᐃᓇᐸᑕᓇ ᐃᐃ·ᐅ ᐱ·ᐊᐱᒃ ᓴᐸᓱᒋᑲᓂᒃ ᑲᐸ·ᐊᓱᒋᑲᒐᓂᒃ ᐊ·ᐃᔭ ᐅᓇᑭᓱᒃ. ᐅᐅ·ᐅ ᐱ·ᐊᐱᒃ ᑭᐳᓂᕿᒪᑲᓇ ᓱᐊᓇᒋᒋᑲᒐᓂᒃ ᑲᐸ·ᐊᓱᒋᑲᒐᒃ ᐊᑭᑕᓱᓇ ᐃᐃᒪ ᑲᒪᖃᑲ·ᐊᑭᓱ·ᐃᓂᒃ ᐅᓇᒋᒪᑲᓇ ᑕᑯ ᐃᓂ ᓱᑎᔭᒪ, ᑲᓚᕐᔭᑦ, ᑲᓚᓱᔭᒪ ᑲᓇ ᒪᑲᓂᓱᔭᒪ.

ᓯᕋᓇᔭᑦ

URANIUM (U) *Atomic Number: 92*

Uranium, relatively common in the Earth's crust, comes from the mineral uraninite, also known as pitchblende. It fuels nuclear reactors around the world, some of which produce technetium-99m (Tc-99m), the most-used radiopharmaceutical in nuclear medicine. The National Research Universal reactor in Chalk River, Ontario, is one of five reactors that supplies the world's Tc-99m, used for the diagnosis and treatment of life-threatening diseases.

ᓯᕋᓇᔭᒪ (U) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 92

ᓯᕋᓇᔭᒪ, ᐅᓇᒋᒪᑲᓇ ᐊᑭᒃ ·ᐊᑭᑕᑲᒥᒃ, ᐊᓱᓇ ᓯᕋᓂᓇᔭᑦ, ᑲᓇ ᐃᓱᓂᑲᒐ ᐱᒐᐸᓗᓇᑦ. ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ ᑭᒋᐸᓱᒋᑲᓇ ᒥᓱ·ᐅᑲᒥᒃ, ᐊᓂᑦ ᑲᐅᒋᐅᓱᒋᑲᒐᒃ ᑌᒃᑐᑎᔭᒪ - 99m (Tc-99m), ᒥᐅ·ᐅ ᑲᐃᓱᐊᐸᑕᒃ ᒪᖅᑭᒋᐃ ᐊᐸᒋᒋᑲᓂᒃ ᑲᒪᑭᓱᕿᒪᑲᒃ ᒪᖅᑭᑭ. ᒥᓱ·ᐅᑲᒥᒃ ᓇᓇᑕ·ᐃᑭᕿᓇᒋᕿ·ᐃᓇ ᑲᑕᓱᐅᓱᒋᑲᒐᒃ ᑭᓱ·ᐅᑲᒥᒃ ᑲᐅᓇᑎᓇᒧ·ᐊᒐᒃ Tc-99m, ᑲᐃᓇᐸᒋᑐ·ᐊᒐᒃ ᑲᐅᓇᒋᕿᕿᒋᑲᒐᒃ ᐃᓇᐱᓐᓇᓇ ᑲᓇ ᑲᐊᓇᑕ·ᐃᒋᑲᒐᒃ ᑲᓇᓂᓴᓂᐃ·ᐯᒪᑲᑭᓇ ᐃᓇᐱᓐᓇᓇ.

ᑭᑕᔭᓇ

TITANIUM (Ti) *Atomic Number: 22*

Titanium, from the minerals rutile and ilmenite, offers the strength of steel with only 60 per cent of the weight, as well as high corrosion resistance. As metallic biomaterials, titanium and titanium alloys are used for implants, from dental implants and hip replacements to heart pacemakers and cochlear implants.

ᑕᔭᒐᓂᔭᒪ (Ti) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 22

ᑕᔭᒐᓂᔭᒪ ᐱ·ᐊᐱᒃ ᐅᓇᒋᒪᑲᓇ ᐊᓱᓂᒃ ᑭᑕᔭᓇ ᑲᓇ ᐃᓚᒥᓇᔭᑦ, ᒪᖃᑲ·ᐊᐱᑭᕿᒪᑲᓇ ᑲᐱ·ᐊᐱᑯ·ᐊᒃ 60% ᐯᑕ ᑲᐊᐱᑎᓂᑯᒃ, ᑲᓇ ᑲ·ᐃᓇ ᒋ·ᐊᑭ ᐱ·ᑲᐱᑭᑕᒪᑲᒃ. ᑕᐱᖁ ᐱᑯ ᑲᐃᓱᓇ·ᑲᑭᓇ ᐱ·ᐊᐱᑯᓇ, ᑕᔭᒐᓂᔭᒪ ᑲᓇ ᑕᔭᒐᓂᔭᒪ ᑲᑕᑯᓂᑲᒐᑭᓇ ᐃᓇᐸᒋᒋᑲᒐ·ᐊᓇ ᐅᐅᒋᐅᓱᒋᑲᒐᑭᓇ ᑲᓇᐱᖁᑲᒐᑭᓇ, ᑕᐱᖁ ·ᐃᐱᑎᑲᓇᒃ ᑲᓇ ᐅᓄᑲᓇ ᑲᐅᓱᒋᑲᒐᒃ ᑲᓇ ᒥᐃᐃ ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᒃ ᑲᓇᐱᖁᑲᒐᒃ ᑲᓇᐱᖁᑲᒐᒃ ᑲᓇᓂᓴᓂᐃ·ᐯᒪᑲᑭᓇ ᐃᓇᐱᓐᓇᓇ.

ᐸᔭᕈᓗᓴᔭᑦ

MANGANESE (Mn) *Atomic Number: 25*

Manganese usually occurs with iron or in other minerals. When mined, it is primarily derived from the mineral pyrolusite. Manganese is required for normal biological functions in humans, including development, metabolism, and the antioxidant system.

ᒪᓇᑲᓂᓴ (Mn) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 25

ᒪᓇᑲᓂᓴ ᐅᓇᒋᓂᑕ·ᐃᑭᒪᑲᓇ ᐊᔭᕋᓇ ᕿᒪ ᑲᓇ ᑯᑕᑭᔭᓇ ᐊᓱᓂᑲᒐ. ᐊᐱ ᑭᒧᓇᐃᑲᒐᒃ, ᐃᐃᒪ ᐅᓇᒋᐅᑕᐱᓂᑲᒐ ᐊᓱᓂᑲᒐᒃ ᐸᔭᕈᓗᓴᔭᑦ. ᒥᔭ·ᐃᑲ ᑲᑕ·ᑲᒃ ᐃᓇᓄᑭᒪᑲᓇ ·ᐅ·ᐅᓂ ᒋᓇᓄᑭᒪᑲᓂᒃ ᐅᒥᔭ·ᐃᑲ, ᑕᑯ ᑲᐱᒥᑭᒪᑲᓂᒃ, ᑭᐅᒋ ᐅᑐᐱᓇᓇᓂᐊᓱᓇᓂᐊᓱᓇᓂᒃ, ᐅᓇᒋᒪᑲᓇ ᑲᓇᐃᓇ ᑲᓇᒋᒋᑲᒐᒃ ᐊᓱᓂᒃ ᑕᐱᖁ ᐊᓱᓂᒃ ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ. ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ ᒥᓱ·ᐅ ᒥᔭᐃᒃ, ᑕᑯ ᐃᓂ ᓱᑎᔭᒪ, ᑲᓚᕐᔭᑦ, ᑲᓚᓱᔭᒪ ᑲᓇ ᒪᑲᓂᓱᔭᒪ.

ᐃᒪᑕᔭᑦ

IRON (Fe) *Atomic Number: 26*

Iron, the fourth most abundant element in the Earth's crust, is most often extracted from the minerals hematite and magnetite. The body gets iron from food, using it to help metabolize proteins and to make hemoglobin, which carries oxygen from the lungs to the rest of the body.

ᐊᔭᕋᓇ ᐱ·ᐊᐱᒃ (Fe) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 26

ᐊᔭᕋᓇ ᐱ·ᐊᐱᒃ ᒥᐅ·ᐅ ᐯᓱᒃ ᓂ·ᐃᓇ ᑲ·ᐅᓄᑭᔭᒪᑲᒃ ᐊᑭᑲᒃ, ᒪᓇᓱᓂ·ᐊᒐ ᑲᐃᓱᑕᑯᓱᒃ ᐃᒪᑕᔭᑦ ᑲᓇ ᒪᒃᑐᑕᔭᑦ ᐊᓱᓂᑲᒐ. ᐊᔭᕋᓇ ᐃᓇᒐᓇᒃ ᒥᔭ·ᐃᒃ ᒥᒥᒥᑲᒃ, ᐃᓇᓄᑭᒪᑲᓇ ᒋᒥᓄᖅᑲᕿᒪᑲᒃ ᒥᒥᒃ ᑲᓇ ᒋᒥ·ᓇᑲᒥᒋᕿᒪᑲᒃ ᒥᓴᑯ ᒋᐅᒋ·ᐃᒋᐃ·ᐯᒪᑲᒃ ᐸᑭᓇᒧ·ᐃᓂᒃ ᐅᐸᓂᒃ ᒥᓱ·ᐅ ᒋᓇᒐᑲᒃ ᒥᔭ·ᐃᒃ.

ᓴᐸᓗᕋᔭᑦ

ZINC (Zn) *Atomic Number: 30*

Zinc, from minerals such as sphalerite and smithsonite, is the fourth most commonly used metal and the second most common trace metal in the human body. As an important micronutrient, it helps generate cells, activate bone and organ development, enable brain functions, and strengthen the immune system. Zinc deficiency, correctible by supplements, can cause stunted growth, and impeded intellectual development.

ᓯᓇᒃ (Zn) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 30

ᓯᓇᒃ ᐅᓇᒋᒪᑲᓇ ᐊᓱᓂᑲᒃ ᑕᐱᖁ ᓴᐸᓗᕋᔭᑦ ᑲᓇ ᓴᒥᑐᓇᔭᑦ, ᒥᐅ·ᐅ ᐯᓱᒃ ᓂ·ᐃᓇ ᐱ·ᐊᐱᒃ ᑲᓂᑕᐊᐸᑕᒃ ᒥᓇ·ᐊ ᓂᓱᓇ ᑲᐊᔭᒪᑲᒃ ᒥᔭ·ᐃᒃ. ᑭᒋᓇᐸᑕᓇ ᐃᐃᒪ ᒥᔭ·ᐃᒃ ᐅ·ᐃᒋᐃ·ᐅᒪᑲᒃ ᒋᐱᒥᑭᒪᑲᑭᓇ ᕿᑯᓇᓇ, ᒋᒪᖃᑲ·ᐃᑲᒃ ᐅᓇᒋᒪᑲᓇ ᐃᓇᐱᓐᓇᓇ, ᑲᐅᒋᒋᑲᒐᒃ ᐊᓱᓂᒃ ᑕᐱᖁ ᐊᓱᓂᒃ ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ. ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ ᒪᓇᑲᓂᔭᒪ ᑲᐅᒋᒪᒋᑭᒃ ᐱᒪᑎᓱᐃᓇ ᑲᓇᐃᓇ ᒋᑭᒪᑲᓇᓂᐊᒃ. ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ ᒥᓱ·ᐅ ᒥᔭᐃᒃ, ᑕᑯ ᐃᓂ ᓱᑎᔭᒪ, ᑲᓚᕐᔭᑦ, ᑲᓚᓱᔭᒪ ᑲᓇ ᒪᑲᓂᓱᔭᒪ.

ᐸᔭᕈᖃ·ᓚᕐ

NIOBIUM (Nb) *Atomic Number: 41*

Niobium is derived from the minerals pyrochlore and columbite. It is a lustrous, grey, ductile metal with a high melting point, relatively low density, and superconductor properties. Magnetic resonance imaging (MRI) and nuclear magnetic resonance (NMR) machines use superconductor magnets made from niobium-titanium alloy embedded in copper.

ᓇᔭᐱᔭᒪ (Nb) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 41

ᓇᔭᐱᔭᓇ ᐅᓇᒋᒪᑲᓇ ᐊᓱᓂᑲᓇ ᑕᐱᖁ ᐸᔭᕈᖃ·ᓚᕐ ᑲᓇ ᑲᓚᒪᐸᔭᑦ. ᐊᕐᒐᐊᐱᑲᓇ ᐃᐃ·ᐅ ᐱ·ᐊᐱᒃ ᑲᓇ ᑲ·ᐃᓇ ᒋ·ᐊᑭ·ᐃᓂᓇᑭᒪᒃ, ᑲ·ᐃᓇ ᒋᑭᐸᑲᐱᑲᒃ ᑲᓇ ᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᓇ. ᒪᒪᑲᑕᐱᒃ ᓴᓇᐸᒐᓱᒋᑲᓇ (MRI) ᑲᓇ ᓂᔭᒃᓕᕐ ᒪᒪᑲᑕᐱᒃ ᓴᓇᐸᒐᓱᒋᑲᓇ (NMR) ᐊᐸᒋᒋᑲᒐ ᐱ·ᐊᐱᒃ ᑲᐃᖁᑎᐅᑦᑎᐸᐃᕿᒪᑲᒃ ᑲ·ᐃᑯᐱᒋᕿᒪᑲᒃ ᑲᑭᐅᒋᐅᓱᒋᑲᒐᒃ ᑲᑭᐅᒋᐅᓱᒋᑲᒐᒃ ᓇᔭᐱᔭᒪ ᑕᔭᒐᓂᔭᒪ ᐱ·ᐊᐱᒃ ᑕᑯ ᐅᓴ·ᐊᐱᒃ.

·ᒪᓕᐸᒐᓇᔭᑦ

MOLYBDENUM (Mo) *Atomic Number: 42*

Molybdenum, from the mineral molybdenite, contributes corrosion resistance and hardness to stainless steel, making it excellent for sharp cutting edges, like scalpel blades. Molybdenum components are also found in the high-power X-ray tubes of computerized axial tomography (CAT or CT) scanners used to take images of bones, internal organs, blood vessels, and other soft tissue to detect a variety of diseases and conditions.

·ᒪᓕᐸᒐᓇᒪ (Mo) ᐊ·ᑕᒥᒃ ᐊᑭᑕᓱᓇ 42

·ᒪᓕᐸᒐᓇᒪ ᐅᓇᒋᒪᑲᓇ ᐊᓱᓂᑲᒃ ·ᒪᓕᐸᒐᓇᔭᑦ, ᑲ·ᐃᓇ ᒋᐱ·ᑲᐱᑭᒪᑲᒃ ᑲᓇ ᒪᖃᑲ·ᐊᐱᑭᕿᒪᑲᓇ ᐱ·ᐊᐱᒃ, ᑭᒋᓇᐸᑕᓇ ᐅᑲᓱᐳᕿᒪᑲᒃ, ᑕᐱᖁ ᑲᐅᒋᐅᓱᒋᑲᒐᒃ ᒪᒋᓇᓱᐅ ᐸᐸᒋᒋᑲᓇᐱᑯᓇ. ᐅᐅ·ᐅ ᑎᓇ ᐊᓱᓂᑲᒐᒃ ᐃᓱᐊᐸᑕᓇ ᑲᐊᑯᓇᐃᑲᒐᒃ ᒋᒐᑭᓱ·ᐅᒪᑲᓱᓇᒃ ᑲᑕᓱᐅᓱᒋᑲᒐᒃ ᓇᔭᐱᔭᒪ ᑕᑯᓱ ᑲᐃᓇᓄᑭᒪᒃ ᓇᔭᐱᔭᒪ ᑲᑕᓱᐅᓱᒋᑲᒐᒃ ᑲᐅᒋᐅᓱᒋᑲᒐᒃ ᑲᐅᒋᐅᓱᒋᑲᒐᒃ ᑲᐅᒋ