English and Cree

MEDICINE FROM THE GROUND UP

ᑐᑯᓅᐣ ᒍᐢᑕᐢᑲᒥᐠ ᐅᒋ ᐃᔑᐱᒥᐠ ᐃᔑ

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

ᒥᐢᑎ·ᑲᓂᐠ ᐱᓂᔅ ᓂᓂᑫᓯᑕᓂᐠ, ᒥᓴᑲᐠ ᐱᓂᔅ ᐅᐢᑲᓂᐠ, ·ᐃᑎᐱᐠ ᐱᓂᔅᒥᑌᐃᐠ, ᐃᓂᓂ·ᐃ ᒥᔦᐤ ᒥᑫᑐᔦᐠ ᐃᔑᓇ·ᑲᐣ᙮

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.

ᐁ ᑭᐢᑭᓄᐊᒪᓱᓇᓂ·ᐊᐠ ᐊᓂᐃ, ᐁ ᓇᓇᑲᒋᑕᓂ·ᐊᑭ ᐊᓂᐃ, ᓀᐢᑕ ᐁ ᒥᓄᓇᑯᑕᓂ·ᐊᑭ ᐊᓂᐃ, ᒪᒥᑐᓀᑕᒥᐃᑯ·ᐊᐠ ᒥᓄ ᐊᔭ·ᐃᓂᓂᐤ ᑲ ᐱᒥᑕᒋᐠ ᐊᐢᐱᐣ ᑲ ᐃᑕ·ᑲᐠ ᐣᑐᑯᓅᐣ᙮ ᑲᔦᐤ ᒥ·ᓇᒋᐃ·ᐁ·ᐃ ᑐᑕᒧ·ᐃᓇ, ᐊᓄᐨ ᐣᑐᑯᓈ, ᓀᐢᑕ ᑫ ᐊᑎ ᑭᐢᑫᓂᒋᑲᑌᐠ ·ᐊᐸᑫ ᒪᒋᔑᑐᑕᒧᒪ·ᑲ·ᓇ ·ᐁᓄᑎᓯ·ᐃᓂᐠ᙮ ᐊᐢᑭᐠ ᐃᑕ·ᑲ·ᓇ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ᑭᑭᑎᑭ ᑫ·ᑲᓇ ᑫ ᒥᓄ ᑐᑕᑯᔭᐠ᙮ ᑲᓇᑕ ᐊᐢᑭᐠ ᐅᒋᒪ·ᑲ·ᓇ ᐊ·ᐊᓯᑌ60 ᐱ·ᐊᐱᐢ·ᑲ, ᒥᑫᐟ ᑲ ᐣᑕ·ᐁᓂᑕ·ᑲᑭ ᐣᑐᑯᐃ·ᐁ·ᐃᓂᐠ᙮

Mining Makes It Happen! ***ᒍᓇᐃᑫ·ᐃᐣ ·ᐃᒋᐃ·ᐁᒪᑲᐣ***

BODY IN BALANCE

ᒥᔦᐤ ᑕᐱᑕ·ᐃᓯ·ᐃᐣ

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

96 ᐳᕽᓭᐣᐟ ᑲ ᐃ·ᑕᓂ·ᐊᐠ ᐃᑕ·ᑲ·ᓇ ᒥᔦ·ᐃᐠ ᑯ·ᑕᐢ ᑫ·ᑲᓇ ᑲ ᓇᑕ·ᐁᓂᑕ·ᑲᑭ: ᓅᓅ·ᐃᐣ, ᑲᕽᐱᐣ, ᐊᐞᐟᕈᒋᐣ, ᓇᐞᐟᕈᒋᐣ, ᑲᐪᓯᐊᐦᐁᑯᒪᑲ ᑊᐊᐢᑊᐁᓈᐦ ᑲ ᐃᒋᑲᑌᑭ᙮

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.

4 ᐳᕽᓭᐣᐟ ᒪᑲ ᑲ ᐃ·ᑕᓂ·ᐊᐠ ᐸ·ᐁ ᐃᑕ·ᑲ·ᓇ ᐊᓂᐃ ᑲ ᐣᑕ·ᐁᓂᑕ·ᑲᑭ ᓇᓇᑲᐤ ᑲᐃᓇᐸᑎᓯᒪᑲ ᑭ ᑭᔦ·ᐃᓇᐠ᙮ ᒥᓯ·ᐁ ᐅᐅ ᐃᑕ·ᑲ·ᓇ ᑲ ᐃᔑᓅ ᐅᓭᐠ ᐱᐢᑭᑎᑎᐠ ᐊᐢᑭ: ᓱᑐᐢᑊᐃᕽ, ᐊᐟᒧᐢᑊᐃᕽ, ᐊᐞᐟᕈᐢᑊᐃᕽ, ᐁᑯ ᒪᑲ ᐸᐞᐅᐢᑊᐃᕽᑲ ᐃᒋ ᑲᑌᑭ᙮ ᓇᓇ·ᑲᓭᐠ ᐃᔑ ᒪᒪ·ᐃᐸᓂ·ᐊ ᓀᐢᑕ ᑕᔑᓅ ᒪᒥᐡ·ᑲᒋᐸᓂ·ᐊ ᑲ ᐃᔑ ᐸᐯᐱᐢᑭᑎᐠ ᐊᐢᑭ᙮

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.

ᐊᓂᒪ ᒪᑲ ᑲ ᒪᒥᐡ·ᑲᒋᐸᓂᐠ, ᐸᐸᑭᒋᐸᓂᐤ ᒪᑲ ᑲ ᐃᔑ ᑕᐱᑕ·ᐃᓯᒪᑲᐠ ᒥᔦᐤ: ᐁ ᓚᑭᐸᓂᑭ ᓀᐢᑕ ᐱᑯ ᐁᑲ ᐁ ᑕᐱᑕ·ᐃᓯᒪᑲᑭ, ᐊᑎ ᒪᒥᔑᒥᐸᓂᐤᑭᔦ ·ᐃᓇᐠ᙮ ᑭᒋ ᑕᐱᑕ·ᐃᓯᒪᑲᐠ ᒪᑲᑭᔦ·ᐃᓇᐤ ᐃᑌᓂᑕ·ᑲᐣ ᑭᒋ ᒥᒋᔦᐠ ᑲ ᒥᒋᒧ ᑲᑫᒪᑲᐠ ᒥᒋᑦ ᐊ·ᐃᔭᔑᐤ ᓀᐢᑕ ᐱᑯ ᑫ·ᑲᐣ ᑲ ᓂᑕ·ᐃᑭᐠ ᑲ ᐃᔑ ᒥᔑᐃᑕ·ᑲᑭ ᑲ ᒥᓄᑐᑕᑫᒪᑲᑭ᙮ ᐁ ᓄᑌᐸᓂᔭᐠ ᒪᑲ ᐊᓂᐃ, ᐃᑌᓂᑕ·ᑲᐣ ᑭᒋ ᒥᐢᑲᒪᐠ ᑯᑕᐠ ᑫ·ᑲᐣ᙮

medical DEVICES

ᐣᑐᑯᓅᓂ·ᐃ ᐊᐸᒋᑕ·ᐃᓇ

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.

ᐣᑐᑯᓅᓂ·ᐃᑲᒥᑯᐠ ᓀᐢᑕ ᐱᑯ ᐊᑯᓯ·ᐃᑲᒥᑯᐠ ᐃᑕ·ᑲ·ᓇ ᒥᑫᐟ ᐣᑯᓅᓂ·ᐃ ᐊᐸᒋᑕ·ᐃᓇᐱ·ᐊ ᐱᐢᑯᐠ ᑲ ᐅᒋ ᐅᔑᑕᓂ·ᐊᑭ ᑕᐱᔅᑯᐨ ᒋᐢᑕᐃᑲᓇ, ᑲ ᐣᑐᒋᑲᑲᓂ·ᐊᑭ, ᒥᔑ ᐱ·ᐊᐱᐢᑯ·ᐃ ᐊᐸᒋᑕ·ᐃᓇ ᑲ ·ᐃᒋᐃ·ᐁᒪᑲᑭ ᑭᒋ ᐃᑕᐱᓇᓂ·ᐊᐠ ᐊᒋ ᒥᔦ·ᐃᐠ ᐁᑲ ᑭᒋᒪᒋᓭᐟ ᐊ·ᐁ ᓂᑲᐣ ᓀᐢᑕ ᐱᑯ ᑲᓇ·ᐊᐸᒋᑲᑌᑭ ᒥᐢᑲᓇ, ᐱᑕᑭᓇ·ᐊ ᓀᐢᑕ ᐱᑯ ᑯᑕᑭᔦ ᑫ·ᑲᓇ᙮

- ᒪᒋᔑᑫ·ᐃᑲᒥ·ᑲ ᐁᑯ ᒪᑲ ᒪᒋᔑᑫ·ᐃ ᐊᐸᒋᑕ·ᐃᓇ ·ᐊᓯᑯᑎ·ᓇ ᑲ ᒪᐡᑲ·ᐊᐠ ᐱ·ᐊᐱᐢᑯ ᐁ ᑭ ᐅᒋ ᐅᔑᑕᓂ·ᐊᑭ᙮
- ᑲ ᒐᑲᓯᑲᑲᓂ·ᐊᑭ ᐁᑲ ᓯᑭ ᑲ ᓄ·ᑲᑭ ᐱ·ᐊᐱᐢᑲ ᐁ ᐅᒋ ᐅᔑᑕᓂ·ᐊᑭ ᑕᐱᔅᑯᐨ ᐅᐪᒥᓅᐦ ᓀᐢᑕ ᒪᑲ ᑐᒐᔦᐦ ᑲ ᐃᒋᑲᑌᑭ ᑲ ·ᐃᒋᐃ·ᐁᒪᑲᑭ ᐁᑲ ᒥᐢᑕᐃ ᑭᒋ ᒪᒋᔕᐟ ᐊ·ᐁᓂᑲᐣ᙮
- ᑲ ᑭᑭᐡᑭᑲᑌᑭ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ·ᐃᒋᐃᑯᐟ ᐊ·ᐁᓂᑲᐣ ᒥᓇ ᑭᒋ ᑭ ᐊᔦᒋᐟ ᐅᐅ ᐱ·ᐊᐱᐢ·ᑲ ᐁ ᐊᐸᒋᑭ ᑲ ·ᐊᓯ·ᑲᐠ ᑲ ᒪᐡᑲ·ᐊᐠ ᐱ·ᐊᐱᐢᑯᐠ, ᑕᑎᓂᔭᐦᐱ·ᐊᐱᐢᑯᐠ ᐁᑯ ᒪᑲ ᑕᑌᓂᔭᐦ ᑲ ᐅᒋ ᐅᔑᑕᓂ·ᐊᑭ ᐱ·ᐊᐱᐢ·ᑲ᙮

With new discoveries, innovation, and material science, the list goes on!

ᑭᒋ ᒥᑫᑎᐣ ᑫ·ᑲᐣ ᐁ ᐊᑎ ᒥᐢᑭᑲᑌᐠ ᑫ ᐊᑎ ᐊᐸᑕᐠ ᓀᐢᑕ ᐁ ᐊᑎ ᑭᐢᑫᓄᒋᑲᑌᐠ ᑕᐣᑌ ᒥᓇ ᑫ ᐊᑎ ᑐᒋᑲᑌᐠ᙮

Diagnosis

ᑫᑯ ᐊᑯᓯ·ᐃᐣ ᑭᐢᑫᓂᑕᒧ·ᐃᐣ

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.

ᒥᑫ·ᑕ ᐊᐸᑕᐣ ᐱ·ᐊᐱᐢ·ᑲ ᑫ ᐅᒋ ᑭᐢᑫᓂᒋᑲᑌᐠ ᐁ ᐃᑕᐢᐱᓅᐟ ᐊ·ᐁᓂᑲᐣ᙮ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ·ᐃᒋᐃ·ᐁᒪᑲᑭ ᑭᒋ ᑲᓇ·ᐊᐸᒋᑲᑌᐠ ᑕᓅᔑᓇ·ᐃᒪᑲᐠ ᐊᑕᒥᐠ ᒥᔦᐤ ᓅᐢᑕ ᐱᑯ ᐁ ᓇᑕ·ᐃ ᑭᐢᑫᓂᒋᑲᑌᐠ ᑫ·ᑲᐣ ᐊᑯᓯ·ᐃᓂᐠ ᐃᑌᑫ᙮

ᓴᐳ·ᐊᐸᒋᑲᐣ ᐁᐦ ᐊᕽ ᐊᐞ ᑲ ᐃᒋᑲᑌᐠ ·ᐃᒋᐃ·ᐁᒪᑲᐣ ᑭᒋ ᑲᓇ·ᐊᐸᒋᑲᑌᐠᐊ ᓂᒪ ᑲ ᐊᑯᓯᓇᓂ·ᐊᐠ ᐊᑕᒥᐠ ᒥᔦ·ᐃᐠ ᐁ ·ᐃᒋᐃ·ᐁᒪᑲᑭ ᐱ·ᐊᐱᐢ·ᑲ ᑲᑭᐅ ᑎᓇᐠ ᐊ·ᐁᓂᑲᐣ ᑫ ᐅᒋ ᐸᔦᑌᓇ·ᑲᐠ ᐊᓂᒪ ᐊᑯᓯ·ᐃᐣ᙮ ᐱ·ᐊᐱᐢ·ᑲ ᑕᐱᔅᑯᐨ ᒫᓅᓯ, ᐊᐞᐅᐞ ᓀᐢᑕ ᒪᑲ ᑲᑐᒐᓂᔦᐦ ᑲ ᐃᒋᑲᑌᑭ᙮

ᑌᐢᓅᑎᐊᐦ-99ᐁᐦ ᐃᒋᑲᑌᐤ ᑫ·ᑲᐣ ᑲ ᓅ·ᑲᐠ ᓴ·ᐸᐸᒋᑲᓂᐠ᙮ ᐁ·ᑲᓂᒪ ᐅᔅᐦᐊᐸᑕᐠ ᐁ ·ᐃ ᑲᓇ·ᐊᐸᒋᑲᑌᐠ ·ᐃᑎᑊ, ᒥᑌᐃ ᓀᐢᑕ ᒪᑲ ᐅᐢᑲᓇ᙮

TREATMENTS

ᐣᑐᑯᐃ·ᐁ·ᐃᓇ

The list of metals and minerals used for medical treatment is long, including ancient and modern remedies.

ᑭᒋ ᒥᑫᑎ·ᓇ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ᐣᑐᑯᐅ·ᐊᑲᓂ·ᐊᑭ ·ᐁᐡᑳ ᑲ ᑭ ᐊᐸᑕᐠ ᓀᐢᑕᐊᓅ ᑲ ᐊᐸᑕᐠ᙮

Egyptians ingested gold for mental, bodily, and spiritual purification, and gold has been used to fix teeth for over 4,000 years. In the 20th century, gold compounds were found to alleviate symptoms of rheumatoid arthritis.

ᐃᒋ' ᐃᓂᓂ·ᐊᐠ ᐊᐸᒋᑕ·ᐊᑯᐸᐣ ᓭᓂᔭᐢᐱᑯᓂᐤ ᐁ ·ᐃ ·ᐃᒋᐃᑎᓯᒋᐠ ᒥᑐᓅᒋᑲᓂᐠ, ᒥᔦ·ᐃᐠ ᓀᐢᑕ ᐊᒐᑯᐠ ᐃᑌᑫ᙮ 4,000 ᐱᐳᐣ ᐅᒋ ᑭ ᐯᒋ ᐊᐸᑕᐣ ᓭᓂᔭᐢᐱᐦ ᒥᐱᑎᐠ᙮ ᐊᓅ ·ᐃᓇ ᓭᓂᔭᐢᐱᐦ ᑭᓂᑲ·ᐃᓂᑲᑌᐤ ᐣᑐᑯᓅᐠ ᐅᐢᑲᓇᐢᐱᓅ·ᐃᐣ ᐅᒋ᙮

Silver, having anti-bacterial properties, is added to bandages and wound-dressings, catheters, and other medical instruments. Lithium medication helps depression sufferers, and sulphur treats skin diseases, arthritis, and chronic bladder inflammation.

·ᐊᓯ·ᑲᐱᐢ ᐊᐸᑕᐣ ·ᐃᐢᑫᐱᓭ·ᐃᓂᐠ ᐁᑲ ᑭᒋ ᒥᓂ·ᐃᐸᓇᓂ·ᐊᐠ, ᔑᑭ·ᐃᐦᑲ ᐅᒋ ᐅᑕᐃᑲᑌᐠ ᓀᐢᑕ ᑯᑕᑭᔦ ᐣᑐᑯᓅᓂ·ᐃ ᐊᐸᒋᑕ·ᐃᓂᐠ᙮ ᓕᑎᔦᐦ ᑲ ᐃᒋᑲᑌᐠ ·ᐃᒋᐃᑯᐤ ᐊ·ᐁᓂᑲᐣ ᑲ ᐸᑕᐁᓄᒧᐟ᙮ ᓭᐪᐳᕽᑲ ᐃᒋᑲᑌᐠ ·ᐃᒋᐃ·ᐁᒪᑲᐣ ᒥᓴᑲᐠ ᐱᑯᓭᓂ·ᐃᓂᐠ,ᐅᐢᑲᓇᐢᐱᓅ·ᐃᓂᐠ, ᓀᐢᑕ ᑲ ᑕᔑᓅ ᐊᑯᓯᓇᓂ·ᐊᐠ ᒥᓯᓂᐠ᙮

The fight against cancer employs radiation treatment using radioactive isotopes of iodine, yttrium, samarium, palladium, and more. Chemotherapy, another cancer-fighting treatment, commonly uses platinum compounds to target and damage DNA in cancer cells.

ᐊᐞᐅᑕᐞᐣ, ᐃᐟᕆᐊᐦ, ᓴᒪᕆᐊᐦ, ᑉᓚᑎᐊᐦ ᐃᐸᑲᑌ·ᐊ ᐊᑎᐟ ᐱ·ᐊᐱᐢ·ᑲ ᑲ ᐊᐸᑕᐠ ᐁ ᓚᑲᓯᑲᑌᐠ ᑳᓭᕐ ᐊᑯᓯ·ᐃᐣ᙮ ᑭᒍ ᑲ ᐃᒋᑲᑌᐠ ᑯᑕᐠ ᐣ ᑐᑯᐃ·ᐁ·ᐃᐣ ᑳᓭᕐ ᐅᒋ, ᑉᓚᑎᓇᐦ ᐁ ᑭᓂᑲ·ᐃᑎᐠ ᑯᑕᑭᐠ ᐱ·ᐊᐱᐢᑯᐠ ᓀᐢᑕ ᐊᐸᑕᐣ ᐁ ·ᐃ ᓂᒋᑕᓂ·ᐊᐠ ᑲ ᐅᒋ ᐅᔑᒪᑲᐠ ᑳᓭᕐ ᐊᑯᓯ·ᐃᐣ᙮

a different approach to HEALING

ᓇᓇᑲᐤ ᑐᑕᒧ·ᐃᐣ ᒥ·ᓇᒋᐃ·ᐁ·ᐃᓂᐠ

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.

ᐅᑌ ᐃᑌᑫᐢᑲᒥᐠ ᒥᐢᑭᑲᑌᐤ ᓇᓇᑲᐤ ᐱ·ᐊᐱᐢ·ᑲ ᒥᑐᔦᐠ ᐁ ᐃᔑ ᐊᐸᑕᐠ᙮ᓴ ᑯᐨ ᒪᑲ ᐱᑐᐡ ᐣᑐᑯᐃ·ᐁ·ᐃᓂᐠ ᐃᑌᓂᑕ·ᑲᐣ ᐱᑐᐡ ᑭᒋ ᑐᒋᑲᑌᐠ᙮

ᐃᐣᑎᔦ ᐊᐢᑭᐠ ᐃᓂᓂ·ᐊᐠ ᐊᓯᓂᔦ ᐊᐸᒋᐁ·ᐊᐠ ᑕᐱᐡᑯᐨ ᐊᓯᑫᐞ, ᑭᐁᐣ, ᐹᐱ, ᐁᑯ ᒪᑲ ᐊᒥᑎᐢᐟ ᐊᓯᓂᔦ ᐊᐸᒋᐁ·ᐊᐠ ᐁ ᑕ·ᐯᔪᓂᑕᑭᐠ ᑭᒋ ᑕᐱᑕ·ᐃᓯᒪᑲᐠ ᓀᐢᑕ ᓯᑲᑎᓯᒪᑲᐠ ᒥᐡᑲ·ᐃᓯ·ᐃᐣ ᒥᔦ·ᐃᐠ᙮ ᐊᓂᐃ ᒪᑲ ᐊᓯᓂᔦ ᒪ·ᐊᐨ ᑫ ᐅᒋ ·ᐃᒋᐃ·ᐁᓂᒋ ᐊᐣᑕ ᒥᔦ·ᐃᐠ ᐃᔑ ᐸᑭᑎᓅ·ᐊᐠ ᐊᓂᐃ ᐊᓯᓂᔦ ᐁ ᐃᔑ ᑕ·ᐯᔪᓂᑕᑭᐠ ᑭᒋ ᒥ·ᓇᒋᐃᑯᒋᐠ᙮

ᐅᓴ·ᐊᐱᐢ ᐁᑯ ᒪᑲ ᐊᐦᐅᕽ ᐱ·ᐊᐱᐢ ᐣᑐᑯᐅ·ᐊᑯᐊᑲᓂ·ᐊᐣ ᐊᓅ ᓴᑯᒥᑫᐟ ᐊ·ᐁᓂᑲᓇᐠ ᐱᑐᐡ ᑐᑕ·ᒪᐠ ᐁ ᐣᑐᑯᐅ·ᐊᑫᒋᐠ᙮ ᒥᑫᐟ ᑕ·ᐯᔪᓂᑕᑲᐠ ᐁ ᑭᑭᐡ ᑲᐱᐠ ᐅᓴ·ᐊᐱᐢᑯᓯᐤ ᑭ ᐊ·ᓅᒪᑭᑕᑭᐠ ᑲ ᐃᔑ ᐊᑯᐃᑯᑭᐠ ᐅᐢᑲᓇᐢᐱ ᓅ·ᐃᓂ ᓂᐤ ᓀᐢᑕ ᐊᐢᑭᒪᓇᐱᐢᑭᓂᐤ ᑭᒋ ᓂᑲᐊᑭᐠ ᐅ·ᐊᔕᑫᑕᒧ·ᐃᓂ·ᐊᐤ ᓀᐢᑕ ᑕᑯ ᑭᔦ ·ᐊᔕᑫᑕᒧ·ᐃ·ᓇ᙮

ᓂᐢᑕᐦ ᐃᓂᓂ·ᐊᐠ ·ᐁᐡᑳ ᐅᒋ ᐯᒋ ᐊᐸᒋᑕ·ᐊᐠ ᐊᔑᐢᑭᓂᐤ ᑲ ᐃᔑᒥᑫᑎᓂᓂ ᑭ ᐱ·ᐊᐱᐢ·ᑲ ᑲ·ᐃᒋᐃ·ᐁᒪᑲᓂᓂᑭ᙮ ᐅᑕ ᑲᓇᑕᐢᑭᐠ, ᐊᐦᐟᓭᐠ ᐃᓂᓂ·ᐊᐠ ᑭ ᐊᐸᒋᑕ·ᐊᐠ ᐊᔑᐢᑭᓂᐤ ᐁ ᒥᔑᑭ ᐃᑕ·ᑲᓂᓂᑭ ᐱ·ᐊᐱᐢ·ᑲ ᐁ ᐃᒋᐃ·ᐁᒪᑲᓂᓂᑭ ᐊᑕᒥᐠ ᐊᓂᐃ·ᐁᒪᑲᓂᓂᑭ ᐊᑕᒥᐠ ᒥᔦ·ᐃᐠ ᓀᐢᑕ ᐱᑯ ·ᐊᐱᐦ᙮ ᐊᓅ ·ᐃᓇ ᐃᐅᓂᒋᑲᐅ ᐯᐣᑐᓇᐞ ᐊᔑᐢᑭ ᑲ ᑭ ᐸᐢᑯᐦᒋᑲᓂ·ᐊᐠ ·ᐊᒋᐢ ᐊᑯᑌᐤ ᐁ ᑭᓂᑲ·ᐃᓂᑲᑌᐠ, ᑭᒋ ·ᐃᒋᐃ·ᐁᒪᑲᐠ ᐊᑕᒥᐠ ᒥᔦ·ᐃᐠ ᓀᐢᑕ ᐱᑯ ·ᐊᐱᐦ᙮

Native copper
ᐅᑕᐢᑭ·ᐃ ᐅᓴ·ᐊᐱᐢ

Quartz/Amethyst
·ᑳᕽᐢ/ᐊᒥᐟᑎᐢᐟ

Clay
ᐊᔑᐢᑭ

Stainless Steel

ᑲ ᒪᐡᑲ·ᐊᐠ ·ᐊᓯ·ᑲᐱᐢ

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.

ᐊᐦᐅᕽ ᐁ ᑭᓂᑲ·ᐃᑎᐠ ᐟᕈᒥᐊᐦ, ᓂᐟᑯᐟ ᐁᑯ ᒪᑲ ·ᒪᓕᑌᓈᐦ ᑲ ᐃᒋᑲ ᑌᑲ ᐱ·ᐊᐱᐢ·ᑲ, ᐁᑯᑕᓂ ·ᐁᒋ ᐅᔑᑕᓂ·ᐊᐠ ᑲ ᒪᐡᑲ·ᐊᐠ ·ᐊᓯ·ᑲᐱᐢ ᑲ ᐊᐸᑕᐠ ᒪᒋᔑᑫ·ᐃ ᐊᐸᒋᑕ·ᐃᓂᐠ᙮ ᐁᑲ ᐁ ᐊ·ᑲᑯᑎᐠ, ᐁ ᓯᑲᐱᐢᑲᐠ, ·ᒣᒍᒋ ᒪᒋᔑᑫᒪᑲᐠ, ᐁ ᒪᒥᔑᑐᒋᑲᑌᐠ ᓀᐢᑕ ᒪᑲ ᐁ ᒫᒍᔑ·ᐃ ᓇᑲᓂᑫ ᒪᑲᐠ ·ᐁᒋ ᒥ·ᓇᔑᐠ ᑭᒋ ᐊᐸᑕᐠ ᐁ ᒪᒋᔑᑲᓂ·ᐊᐠ᙮ ᐊᐸᒋᑕ·ᐃᓇ ᑕᐱᐡᑯᐨ ᒍᑯᒪᐣ, ᐊᓯ·ᐊᒋᑲᐣ, ᑲ ᐃᔑ ᑲᓯᒋᓚᓂ·ᐊᐠ, ᒥᒋᓯ·ᐃᓇᑎᐠ ᑲ ᐃᔑ ᒪᒋᔑᑲᓂ·ᐊᐠ ᓀᐢᑕ ᑯᑕᑭᔦ ᐊᐸᒋᑕ·ᐃᓇ ᑕᐱᐡᑯᐨ ᐊᒋ ᒥ·ᑕᑲᐠ ᑲ ᐃᑕᐱ ·ᐊᑲᑲᓂ·ᐊᐠ, ᔑᑭ·ᐃᐣ ᐁ ᐅᑕᐃᑲᑌᐠ᙮

KEY TERMS

ᐃ·ᑌ·ᐃᓇ ᑲ ᐊᐸᑕᐠ

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)

ᑲ ᒥ·ᓇᔑᐠ ᑲ ᐃ·ᑕᓂ·ᐊᐠ, ᐁ·ᑲᓂᒪ ᐁ ᐯᔦ·ᑲᐠ ᑫ·ᑲᐣ ᐁᑲ ᑯᑕᐠ ᐱ·ᐊᐱᐢ ᐁ ᑭᑭᑎᐠ ᑕᐱᐡᑯᐨ ᑲ ᐅᓴ·ᐊᐱᐢᑲᐠ ᓭᓂᔭᐢᐱᐦ, ᓅᓅ·ᐃᐣ ᓀᐢᑕ ᐱᑯ ᓂᐱᐦ

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

ᐁᒐᒥᐣᐟ ᐃᒋᑲᑌᐤ ᑫ·ᑲᐣ ᐁ ᒥ·ᓇᔑᐠ᙮ ᒍᓇ ᑫ·ᑲᐣ ᑭᑭᑎᐣ ᐊᐣᑕᐠ᙮ ᐁ·ᑲᓂᒪ ᑯᑕᐠ ᐱ·ᐊᐱᐢ ᐁᑲ ᑲ ᑭ ᐱ·ᑲᐃᑲᑌᐠ᙮ ᑕᐱᐡᑯᐨ ᐅᓴ·ᐊᐱᐢ᙮

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

ᑲᐦᐳᐣᐟᒪ ᐃᒋᑲᑌᐤ ᑯᑕᐠ ᐱ·ᐊᐱᐢ·ᑲ ᓂᔓ ᓀᐢᑕ ᐱᑯ ᐊ·ᐊᓯᑌ ᓂᔓ ᐱᑐᐦ ᐱ·ᐊᐱᐢ·ᑲ᙮ ᑕᐱᐡᑯᐨ ᓱᑎᔦᐦ ᐟᓘᕆᐦ ᐁ ᐃᒋᑲᑌᐠ᙮

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)

ᒥᓂᕈᐣ ᒪᓇ ᐃᒋᑲᑌᐤ ᐱ·ᐊᐱᐢ·ᑲ ᑳᑳᐨ ᑲ ᐅᔑᐃᑎᓯᑲᐟ: ᑕ·ᐯ ᒥᓂᕈᐣ ᑭᒋ ᐃ·ᑕᓂ·ᐊᐠ ᐃᑌᓂᑕ·ᑲᐣ ᑭᒋ ᒥᔑᑕ·ᐊᐠ, ᒪᐡᑲ·ᐊᐠ ᓀᐢᑕ ᒪᑲ ᑳᑳᐨ ᓂᑕ·ᐃᑭᐠ, ᓀᐢᑕ ᑭᒋ ᐃᑕ·ᑲᐠ ᑯᑕᐠ ᐱ·ᐊᐱᐢ·ᑲ ᑕᐱᐡᑯᐨ ᓱᑎᔦᐦ ᐠᓘᕆᐦ᙮

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)

ᒥᐢᑯᐦ ᑲ ᐃᐸᑕᓂ·ᐊᐠ ᐁ·ᑲᓂ ᓂᔓ ᐱ·ᐊᐱᐢ·ᑲ ᐁ ᑭᑭᑎᑭ ᐊᐣᑕ ᐯᔦᐠ ᐱ·ᐊᐱᐢᑯᐠ ᓴᑯ ᒪᑲ ᐁ ᐯᔦ·ᑯᑎᑭ᙮ ᑕᐱᐡᑯᐨ ᐊᑌ·ᐢᑭᐞ (ᑲ ᒪᐡᑲ·ᐊᐠ ᐱ·ᐊᐱᐢ)

mining MATTERS

MiningMatters.ca

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NATURAL RESOURCES
ᐧᐁᓇᑎᓯᐧᐃᓇ

LEGEND ᑭᐢᑭᓄᐧᐊᑕᓯᓇᐃᑲᐣ

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

ᐊᐟᑲᐃ ᐱᐧᐊᐱᓯᐧᑲ | ᐊᐟᑲᓚᐃᐣ ᐱᐧᐊᐱᐢᐧᑲ | ᐊᐠᑎᓂᑌᐢ | ᑲ ᐊᒋᓇᐧᑲᑭᐱᐧᐊᐱᐢᐧᑲ | ᑯᑕᑭᔭ ᐱᐧᐊᐱᐢᐧᑲ | ᐁᑲ ᑲ ᐱᐧᐊᐱᐢᑯᐧᐊᑭ

Halite
ᐊᓚᐃᐟ

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.

ᓱᑎᐊᑦ - 11 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓱᑎᐊᑦ, ᑲ ᓇᑕᐧᐁᓂᑕᐧᑲᐠ ᒥᔭᐧᐃᐠ, ᒥᑯᑐᓴᐠ ᐱᐧᐊᐱᐢᑯᐠ ᐃᔑ ᒥᐢᑭᑲᑌᐤ ᑕᐱᐦᑯᐨ ᑊᐁᐟᐢᐸᐣ, ᓱᑕᓚᐃᐟ, ᓀᐢᑕ ᒪᑲ ᐊᓚᐃᐟ. ᐧᐃᒋᐃᐧᐁᒪᑲᐣ ᒥᔭᐧᐃᐠᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒪᑲᑭ ᐅᑌᐣᑕᑕᔭᐱᔭ, ᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒪᑲᐠ ᓂᓯᑐᓯᐧᐃᐣ, ᐯᔭᐧᑲᐣ ᑭᒋᐃᑕᐦᑌᐠ ᒥᑯᐤ, ᑭᒋ ᑕᐱᑕᐧᐊᐠ ᓂᐱ.

Sylvite
ᓯᐟᑊᐊᐃᐟ

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.

ᐳᑕᓯᐊᑦ - 19 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓯᐟᑊᐊᐃᐟ ᐁᑯ ᒪᑲ ᑲᓚᐃᐟ ᑲ ᐃᒋᑲᑌᑭ ᐱᐧᐊᐱᐢᐧᑲ ᐅᒋ ᐅᔑᐃᑎᓯᒪᑲᐣ ᐳᑕᓯᐊᑦ ᑲ ᐃᒋᑲᑌᐠ ᐱᐧᐊᐱᐢᐠ ᑲ ᓇᑕᐧᐁᓂᑕᐧᑲᐠ ᒥᔭᐧᐃᐠ. ᐧᐃᒋᐃᐧᐁᒪᑲᐣᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒪᑲᐠ ᒥᔭᐤ. ᐧᐃᒋᐃᐧᐁᒪᑲᐣ ᓀᐢᑕ ᒥᑌᐃᐠ, ᒥᐢᑲᓂᐠ ᓀᐢᑕ ᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒋᐠ ᒥᑌᐢᑕᑕᔭᐠ. ᐧᐃᒋᐃᐧᐁᒪᑲᐣ ᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒪᑲᐠ ᐅᒥᓂᐢᑭᐧᐃᐦᑯᑌᐤ ᒥᔭᐧᐃᐠ ᐊᔑᐨ ᑯᑕ ᑭᔭ ᐱᐧᐊᐱᐢᐧᑲ ᑕᐱᐦᑯᐨ ᓱᑎᐊᑦ, ᐠᓗᑫᐃᐟ, ᑲᐟᓯᐊᑦ ᓀᐢᑕ ᒪᐠᓂᓯᐊᑦ.

Lepidolite
ᒉᐱᑐᓚᐃᐟ

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.

ᓭᓯᐊᑦ - 55 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓭᓯᐊᑦ ᐊᐢᑲᐤ ᐱᑯ ᐃᑕᐧᑲᐟ ᑭᑭᑎᐟ ᐯᐠᒪᑕᐃᑎᐢ ᐁ ᑭᑭᑎᑭ ᐳᓗᓴᐃᐟ ᐁᑯ ᒪᑲ ᒉᐱᑐᓚᐃᐟ ᑲ ᐃᒋᑲᑌᑭ ᐱᐧᐊᐱᐢᐧᑲ. ᐧᐃᒋᐃᐧᐁᒪᑲᐟ ᐁ ᐸᓇᐧᐊᐸᒋᑲᑌᐠ ᒥᑯ. ᓭᓯᐊᑦ ᐢᓗᓚᐃᐟ ᑲᐟᓯᐢ ᐁ ᐧᐃ ᑐᑯᑕᓂᐧᐊᐠ ᐃᓇᐸᑕᐟ. ᒪᐦᑯ ᑕᑭᑭᐟ ᑭᒋ ᓂᐸᑕᒪᑲᐠ ᑲᐟᓯᐦ ᐊᑯᓯᐧᐃᐟ.

Gypsum/Selenite
ᒋᑊᓯᑦ / ᓭᓓᓇᐃᐟ

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.

ᑲᐟᓯᐊᑦ - 20 ᑲ ᐃᑕᓯᓇᑌᐠ

ᑲᐟᓴᐃᐟ ᐁᑯ ᒪᑲ ᒋᑊᓯᑦ ᑲ ᐃᒋᑲᑌᑭ ᐱᐧᐊᐱᐢᐧᑲ ᐅᑎᓂᑲᑌᐤ ᐅᒪ ᑲᐟᓯᐊᑦᓀᐢᑕ ᐊᓯᓂᐠ ᐅᑎᓂᑲᑌᐤ ᓚᐃᐢᑐᐣ, ᑐᓗᐢᑐᐣ ᒪᑲ ᒫᐳᐟ ᑲ ᐃᑎᒋᐠ ᐊᓯᓂᔭᐠ. ᑲᐟᓯᐊᑦᑲ ᐃᒋᑲᑌᐠ ᐁᐧᑲᓂᒪ ᐯᔭᐠ ᑲ ᑭᐢᑌᓂᑕᐧᑲᐠ ᒥᔭᐧᐃᐠ ᑲ ᐧᐃᒋᐃᐧᐁᒪᑲᐠ ᐅᐢᑲᓂᐠ ᓀᐢᑕ ᒥᐱᑎᐠ. ᐧᐃᒋᐃᐧᐁᒪᑲ ᐧᑲᔭᐣᐠ ᑭᒋ ᐸᐸᑲᐧᐊᐠ ᒥᑌᐃ ᓀᐢᑕ ᐁᑲ ᑭᒋ ᐧᐊᑐᐧᐃᐸᓂᐠ ᒥᑯ. ᐃᑕᐧᑲᐧᓇ ᓀᐢᑕ ᐅᑐᓗᓇ ᐁᑲ ᑭᒋ ᐊᑎ ᔓᐢᑲᑭ ᒥᐢᑲᓇ ᐁ ᐊᑕ ᑭᒉᔭᐊᐧᐃᐟ ᐊᐧᐁᓂᑲᐟ.

Barite
ᐸᕋᐃᐟ

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.

ᐸᕆᐊᑦ - 56 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐸᕆᐊᑦ ᐱᐧᐊᐱᐢᐠ ᓄᐢᑲᐱᐢᑲᐤ ᓀᐢᑕ ᐧᐊᓯᐧᑲᐱᐢᑲᐤ. ᐸᕋᐃᐟ ᐱᐧᐊᐱᐢᑯᐠ ᐅᒋ ᐅᔑᑕᓂᐧᐊᐤ. ᐁ ᔑᐧᐸᒥᐟ ᐊᐧᐁᓂᑲᐤ ᐅᑯᑕᐦᐧᑲᐠ ᐊᐸᑕᐤ ᐁᑲ ᑭ ᐃᐢᐧᑲᔦᑯᐧᐊᐤᑕᑲ ᐃᔑ ᓴᐳᐧᐊᐸᒥᐟ. ᐸᕋᐃᐟ ᐱᐧᐊᐱᐢᐠ ᐊᐸᑕᐤ ᐁ ᓇᑲᐃᑲᑌᐠ ᓴᐧᐸᐸᒋᑲᐤ ᒪᐢᑲᓯᑲᓇ. ᑲᐃᔑ ᓴᐧᐸᐸᒋᑲᓂᐧᐊᐠ ᐊᑯᓯᐧᐃᑲᒥᑯᐠᐊᐸᑕᐤ ᐁᑲ ᑭᒋ ᐃᐢᐧᑲᓯᑫᒪᑲᐠ ᒪᑲᓯᑲᓇ.

Uraninite
ᔪᑫᐣᑐᓇᐃᐟ

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.

ᔪᑐᓂᔭᑦ - 92 ᑲ ᐃᑕᓯᓇᑌᐠ

ᔪᑫᐣᑐᓇᐃᐟ ᐱᐧᐊᐱᐢᑯᐠ ᐅᒋ ᐅᔑᑕᓂᐧᐊᐣ ᐅᒪ ᔪᑐᓂᔭᑦ. ᐱᐨᐱᐟᐟ ᓀᐢᑕ ᐃ ᔑᓂᑲᑌᐤ. ᐱᑕᐸᐧᐊᒋᑲᑲᓂᐧᐊᐠ ᑲ ᐃᔑ ᑲᓇᐧᐁᓂᒋᑲᑌᐠ ᒪᐧᐊ ᑲ ᒪᐦᑲᐧᐊᐠ ᐊᐦᑯᑌᐤ ᑲ ᐸᑭᑌᐠ ᓀᐢᑕ ᑲ ᐅᒋ ᐅᔑᐅᒪᑲᐠ ᑌᐠᓂᑎᐊᑦ-99. ᐁᐧᑲᓂᒪ ᒪᐧᐊ ᑲ ᐊᐸᑕᐠ ᐣᑐᑯᓄᓂᐠ ᑲ ᐃᔑ ᓇᑕᐧᐃ ᑭᐢᑫᓂᒋᑲᑌᐠ ᐅᒪ ᑲ ᒪᐦᑲᐧᐊᐠ ᐊᐦᑯᑌᐤ ᐧᒐᐠ ᕆᑊᐅᐢ ᐅᐣᑌᕆᐅ ᐊᐢᑭᐠ ᑲ ᐃᑕᐧᑲᐠ ᐃᔑ ᑲᓇᐧᐁᓂᒋᑲᐤ ᐅᒪ ᑌᐠᓂᑎᐊᑦ-99 ᑲ ᐊᐸᑕᐠ ᐁ ᑭᒋ ᐊᑯᐃᐧᐁᒪᑲᐠ ᐊᑯᓯᐧᐃᐣ.

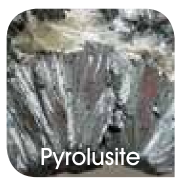
Rutile
ᕈᑕᐃᐟ

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.

ᑕᐃᑌᓂᔭᑦ - 22 ᑲ ᐃᑕᓯᓇᑌᐠ

ᑕᐃᑌᓂᔭᑦ, ᕈᑕᐃᐟ ᐁᑯ ᒪᑲ ᐁᐟᒣᓇᐃᐟ ᐱᐧᐊᐱᐢᑯ ᑲ ᐅᐱᒪᑲᐠ, ᑲ ᐃᐢᐱᒋ ᒫᐦᑲᐧᐊᐠ ᑲ ᐧᐊᓯᐧᑲᐠ ᑲ ᒫᐦᑲᐧᐊᐠ ᐱᐧᐊᐱᐢᐠ ᐃᐢᐱᒋ ᒫᐦᑲᐧᐊᐣ ᓴᑯ ᑫᑲᐟ ᐊᐱᑕᐤ ᐃᐢᐱᒋ ᓇᑲᔑᐟ. ᒧᓇ ᐊᐧᑲᑯᔑᐧᐃᑎᐟ. ᕈᑕᐃᐟ ᐁᑯ ᒪᑲ ᐁᐟᒣᓇᐃᐟ ᐱᐧᐊᐱᐢᑯ ᐊᐸᑕᐟ ᐁ ᒥᐡᑲᒋ ᐊᑯᑲᑕᓂᐧᐊᐠ ᑫᐧᑳᐟ ᒥᔭᐧᐃᐠ, ᒥᐱᑎᐠ ᐅᒋ ᐱᓂᐡ ᒥᑐᐧᑲᓂᐠ, ᐱᓂᐡ ᒥᑌᐃ ᐅᒥᓂᐡᑭᔑᐡ ᓀᐢᑕ ᐱᒋ ᒥᐧᑕᑲᐠ.


Pyrolusite
ᐸᐃᕈᓗᓴᐃᐟ

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.

ᒪᐣᑲᓂᐣ - 25 ᑲ ᐃᑕᓯᓇᑌᐠ

ᒪᐣᑲᓂᐣ ᑭᓂᑲᐧᐃᑎᐠ ᐊᐃᐅᐢᐣ ᐱᐧᐊᐱᐢᑯᐠ ᓀᐢᑕ ᑯᑕᑭᔭ ᐱᐧᐊᐱᐢᑯᐠ. ᐁ ᒍᓇᐃᑲᑌᐠ ᐸᐃᕈᓗᓴᐃᐟ ᐱᐧᐊᐱᐢᑯᐠ ᐃᔑ ᐊᑯᑫᐤ. ᒪᐣᑲᓂᐣ ᐧᐃᒋᐃᐧᐁᒪᑲᐠᑲ ᐃᔑ ᐊᐸᑎᓯᒪᑲᐠ ᒥᔭᐤ ᐅᐱᑭᐧᐃᓂᐠ, ᓂᓴᒪᐧᐃᓂᐠ ᓀᐢᑕ ᒪᑲ ᑲ ᐅᒋ ᐸᓭᑭᑕᓂᐧᐊᐠ ᒥᑯ.

VISIT: http://ed.ted.com/periodic-videos to see a video lesson about every element on the periodic table.

ᐃᑕᐱ http://ed.ted.com/periodic-videos ᑭᒋ ᑲᓇᐧᐊᐸᑕᒪᐣ ᒪᑲᐢᑌᐸᓂᒋᑲᐣ ᐁ ᑭᐢᑭᓄᐊᒪᑲᓂᐧᐊᐠ ᐅᐅ ᐱᐧᐊᐱᐢᐧᑲ.

Hematite
ᐁᒪᑕᐃᐟ

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.

ᐊᐃᐅᐢᐣ ᐱᐧᐊᐱᐢᑭᐠ - 26 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐊᐃᐅᐢᐣ ᐱᐧᐊᐱᐢᑭᐠ ᐁᒪᑕᐃᐟ ᐁᑯ ᒪᑲ ᒪᐠᓀᑕᐃᐟ ᐱᐧᐊᐱᐢᑯᐠ ᐅᒋ ᐅᑎᓂᑲᑌᐤ. ᒥᒋᒥᐠ ᐅᒋᐸᓂᐤ ᐊᐃᐅᐢᐣ ᑲ ᓇᑕᐧᐁᓂᑕᐧᑲᐠ ᒥᔭᐧᐃᐠ ᑭᒋ ᐧᐃᒋᐃᐧᐁᒪᑲᐠ ᓂᓴᒪᐧᐃᓂᐠ ᓀᐢᑕ ᑭᒋ ᐅᔑᑕᒪᑲᐠ ᒥᑯ. ᐁᑯᑕᓂ ᐧᐁᒋ ᐧᐃᒋᐃᐧᐁᒪᑲᐠ ᑐᑐᐧᐃᐟ ᒥᐸᓂᐠ ᑭᒋ ᐅᒋ ᐸᓂᐠ ᓀᐢᑕ ᒥᓯᑌᐸᓂᐠ ᒥᔭᐧᐃᐠ.

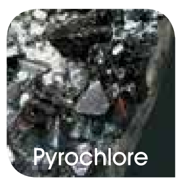
Sphalerite
ᑊᐊᕈᕆᐃᐟ

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.

ᐢᐃᐣᐠ ᐱᐧᐊᐱᐢᑭᐠ - 30 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐢᐃᐣᐠ ᐱᐧᐊᐱᐢᑭᐠ, ᑊᐊᕈᕆᐃᐟ ᐁᑯ ᒪᑲ ᐢᒥᐟᓴᓂᔭᐟ ᐱᐧᐊᐱᐢᑯᐠ ᑲ ᐅᒋᒪᑲᐠ, ᐁᐧᑲᓂᒪ ᒥᓇ ᑯᑕᐠ ᐱᐧᐊᐱᐢᑭᐠ ᑲ ᑕᔑᐣ ᐊᐱᑕᐠ ᓀᐢᑕ ᐅᓴᑦ ᑲ ᐃᑕᐧᑲᐠ ᒥᔭᐧᐃᐠ. ᑭᐢᑌᓂᑕᐧᑲᐟ ᓇᐢᐱᐨ ᐁ ᐧᐃᒋᐃᐧᐁᒪᑲᐠ ᒥᐢᑲᓂᐠ, ᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒪᑲᑭ ᐱᑕᑭᓇᐧᐊ, ᐧᐃᒋᐃᐧᐁᒪᑲᐠ ᐧᐃᑎᐱᐠ ᓀᐢᑕ ᒫᐦᑲᐧᐃᓯᐦᑲᒪᑲᐟ. ᐁ ᐊᐱᓴᔑᐠ ᐅᒪ ᑊᐊᕈᕆᐃᐟ ᒥᔭᐧᐃᐠ ᑲᑕ ᑲᐧᑲᐢᑯᓯᐤ ᓀᐢᑕ ᑲᑭᐸᑎᓯᐤ ᐊᐧᐁᓂᑲᐟ.

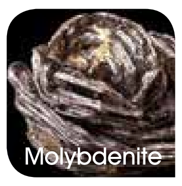

Pyrochlore
ᐸᐃᕈᐠᓗᐟᕋ

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.

ᓇᐃᐅᐱᐊᑦ - 41 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓇᐃᐅᐱᐊᑦ ᑲ ᐃᒋᑲᑌᐠ ᐱᐧᐊᐱᐢᐠ, ᐸᐃᕈᐠᓗᐟᕋ ᐁᑯ ᒪᑲ ᑯᓗᑦᐸᐃᐟ ᑲ ᐃᒋᑲᑌᑭ ᐱᐧᐊᐱᐢᐧᑲ ᐅᒋᒪᑲᐣ. ᐧᐊᓯᐧᑲᐤ, ᐧᐊᐱᑌᐧᐊᐤ, ᔑᐯᑭᐸᓂᐤ ᓀᐢᑕ ᐧᐊᐸᑲᒥ ᑎᑭᑌᐤ, ᐧᐊᑫᐧᐊᐟ ᓀᐢᑕ ᒪᑲ ᐧᐃᐸᐨ ᑭᓴᒋᐢᑭᑌᐤ. ᐁᑦᐊᔅᐊᐃ ᓴᐧᐸᐸᒋᑲᐟ ᐁᑯ ᒪᑲ ᑲ ᒫᐦᑲᐧᐊᐠ ᒪᑲᓯᑲᐟ ᐊᐸᒋᑕᐧᐊᐠ ᑲ ᐧᐊᑕᑲᒥ ᑭᓴᐱᐢᑭᑌᑭ ᐊᐦᑯᑌᓇ ᓇᐃᐅᐱᐊᑦ ᐁᑯ ᒪᑲ ᑕᐃᑌᓂᔭᑦ ᑲ ᐃᑕᐧᑲᑭ ᐅᓴᐧᐊᐱᐢᑯᐠ.


Molybdenite
ᐧᒪᓚᑊᑌᓇᐃᐟ

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.

ᐧᒪᓚᑊᑌᓇᑦ ᐱᐧᐊᐱᐢᐠ - 42 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐧᒪᓚᑊᑌᓇᑦ ᐱᐧᐊᐱᐢᐠ ᐧᒪᓚᑊᑌᓇᐃᐟ ᑲ ᐅᒋᒪᑲᐠ ᒍᓇ ᐊᐧᑲᑯᔑᐧᐃᑎᐟ ᓀᐢᑕᐧᐃᒋ ᐃᐧᐁᒪᑲᐟ ᑭᒋ ᒫᐦᑲᐧᐊᐠ ᑲ ᒫᐦᑲᐧᐊᐠ ᐱᐧᐊᐱᐢᐠ, ᓇᐢᐱᐨ ᑲᓴᐤ ᑫᐧᑳᐟ ᐊᐟᑕ ᐁ ᐅᒋ ᐅᔑᑕᓂᐧᐊᐠ ᑕᐱᐦᑯᐨ ᒪᒋᔑᑫᐧᐃ ᒍᑯᒪᐟ. ᐧᒪᓚᑊᑌᓇᑦ ᐱᐧᐊᐱᐢᐠ ᓀᐢᑕ ᐊᐸᑕᐟ ᓯᑎᐢᑲᐟ ᑲᐃᒋᑲᑌᐠ ᓴᐧᐸᐸᒋᑲᐟ ᐁ ᑲᓇᐧᐊᐸᒋᑲᑌᑭ ᒥᐢᑲᓇ, ᐱᑕᑭᓇᐧᐊ, ᒥᑯᔭᐱᔭ, ᓀᐢᑕ ᑯᑕᑭᔭ ᐁ ᓇᑕᐧᐃ ᑭᐢᑫᓂᒋᑲᑌᑭ ᓇᓇᑲᐤ ᐊᑯᓯᐧᐃᓇ ᓀᐢᑕ ᑲ ᐊᑎ ᐊᐃᔑᓇᐧᑲᑭ.

Gold
ᐅᓂᓴᓇᐱᐢᐠ

GOLD (Au) *Atomic Number: 79*

Gold is widely distributed in the Earth's crust in low concentrations; it is mined directly and also recovered as a by-product, primarily of copper mining. Used in dentistry for more than 4,000 years, gold's biocompatibility now proves useful in diagnosing and combating disease. Gold nanoparticles help diagnose malaria and treat cancer.

ᐅᓂᓴᓇᐱᐢᐠ - 79 ᑲ ᐃᑕᓯᓇᑌᐠ

ᒥᓯᐧᐁ ᐃᔑ ᒥᐢᑭᑲᑌᐤ ᐅᒪ ᐅᓂᓴᓇᐱᐢᐠ ᓴᑯ ᒍᓇ ᒥᓴ ᑭᒋ ᐊᑯᑫᐠ ᐊᔑᓂᐠ. ᐅᓴᐧᐊᐱᐢᑯᐠ ᓀᐢᑕ ᐅᒋ ᐅᔑᑕᓂᐧᐊᐤ. 4,000 ᐱᐳᓇ ᐊᐸᑕᐤ ᒥᐱᑎ ᐣᑐᑯᐃᐧᐁᐧᐃᓂᐠ. ᑭ ᒥᐢᑭᑲᑌᐤ ᐅᒪ ᐅᓂᓴᓇᐱᐢᐠ ᐁ ᐧᐃᒋᐃᐧᐁᒪᑲᐠᑭᒋ ᒥᐢᑭᑲᑌᐠ ᓀᐢᑕ ᓇᑲᓂᑲᑌᐠ ᐊᑯᓯᐧᐃᐣ ᑕᐱᐦᑯᐨ ᒪᓗᕆᐊ ᐊᑯᓯᐧᐃᐣ ᓀᐢᑕ ᐁ ᐧᐃᐣᑐᑯᑕᓂᐧᐊᐠ ᑲᐟᓯᐢ ᐊᑯᓯᐧᐃᐣ.

Galena
ᑲᓚᓇ

LEAD (Pb) *Atomic Number: 82*

Lead, a metal found in the mineral galena, is heavy and has high molecular density. This density works to provide radiation shielding in applications such as X-ray imaging and positron emission tomography (PET) scans, which involve a radiopharmaceutical.

ᐊᐡᑭᑯᒪᐣ - 82 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐊᐡᑭᑯᒪᐣ ᑲᓚᓇ ᐱᐧᐊᐱᐢᑯᐠ ᐃᔑ ᒥᐢᑭᑲᑌᐤ. ᑯᓯᐧᑲᐣ ᓀᐢᑕ ᓯᑲᐱᐢᑲᐤ. ᐁᓯᑲ ᐱᐢᑲᐠ ᐅᒋ, ᐊᑯᐃᑲᑲᓂᐧᐊᐣ ᐁᑲ ᑭᒋ ᐱᒋ ᒪᑲᓯᑯᓇᓂᐧᐊᐠ ᐁ ᓴᐧᐸᐸᒋᑲᓂᐧᐊᐠ ᑲ ᒫᐦᑲᐧᐊᐠ ᒪᑲᓯᑫᐧᐃᐣ ᐁ ᐊᐸᑕᐠ.

Bismuth
ᐱᐢᒥᐟ

BISMUTH (Bi) *Atomic Number: 83*

Bismuth is primarily produced as a by-product, mostly from processing lead ores; some comes from tungsten ores. Bismuth is found in pharmaceuticals often in treatments for gastrointestinal issues or salves for wound infections.

ᐱᐢᒥᐟ - 83 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐱᐢᒥᐟ ᐊᐡᑭᑯᒪᓇᐱᐢᑯᐠ ᐅᒋ ᐊᓂᐢᑫ ᐅᔑᑕᓂᐧᐊᐣ. ᓴᑯ ᐊᐢᑲᐤ ᑕᐣᐢᑎᐣᐱᐧᐊᐱᐢᑯᐠ ᐅᒋ ᐅᔑᑕᓂᐧᐊᐣ. ᐱᐢᒥᐟ ᐊᐸᑕᐣ ᒥᐧᑲᑕᐡᐧᑲᔭᐱᐠ ᓀᐢᑕ ᒪᑲ ᑭᑫᔑᑲᐣ ᐃᓇᐸᑕᐣ.

Sulphur
ᓴᐟᑊᐅᐢ

SULPHUR (S) *Atomic Number: 16*

Sulphur is a yellow, brittle, non-metallic element, primarily obtained by removing sulphur-containing contaminants from natural gas and petroleum using a process called hydrogenation. Synthetic sulphur is used to treat arthritis, skin diseases such as psoriasis and eczema, and interstitial cystitis, a chronic bladder inflammation.

ᓴᐟᑊᐅᐢ - 16 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐅᒪ ᓴᐟᑊᐅᐢ ᑲᐃᒋᑲᑌᐠ, ᐅᓴᐧᐊᐤ, ᑲᐢᐸᐤ, ᒍᓇ ᐱᐧᐊᐱᐢᑯᐠ ᐃᔑ ᑲᓇᐧᐊᐸᒋ ᑲᑌᐤ,ᑲ ᓂᔑᐧᐊᓇᒋᒋᑫᒪᑲᑭ ᓴᐟᑊᐅᐢ ᐁ ᑭᑭᑎᐠ ᑲ ᑭ ᐅᑕᐃᑲᑌᑭᑲᓯᐠ ᐅᒋ, ᐁᑯᑕᓂ ᐧᐁᒋ ᐅᔑᑕᓂᐧᐊᐠ ᐣᑐᑯᓄᐣ ᐅᐢᑲᓇᐢᐱᓄᐧᐃᓂᐠ, ᐱᑯᓴᑫᐧᐃᐸᓂᐧᐃᓂᐠ, ᑲ ᑕᔑᓄ ᐊᑯᓯᓇᓂᐧᐊᐠ ᐅᓂᓂ.

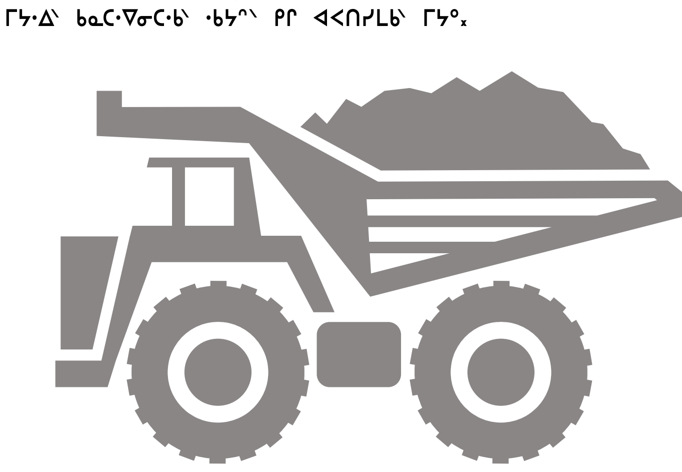
Pentlandite
ᐯᐣᓚᐣᑕᐃᐟ

SELENIUM (Se) *Atomic Number: 34*

Selenium, primarily a by-product of copper refining, typically from chalcopyrite, also occurs in sulphide minerals containing pentlandite, mined for nickel, and galena, mined for lead. It is a trace element nutrient in the human body, essential for proper immune system function, thyroid gland function, and cell usage of thyroid hormone.

ᓭᓕᓂᐊᑦ - 34 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓭᓕᓂᐊᑦ, ᐅᓴᐧᐊᐱᐢᑯᐠ ᑲ ᐅᒋ ᐅᔑᑕᓂᐧᐊᐠ, ᒐᐟᑯᐱᕆᐟ ᑲ ᑭᐅᑎᓂᑲᑌᐠ,ᓀᐢᑕ ᒪᑲ ᓴᐟᐸᐃᐟ ᐱᐧᐊᐱᐢᑯᐠ ᑲ ᐃᔑ ᐃᑕᐧᑲᐠ ᐯᐣᓚᐣᑕᐃᐟ, ᑲ ᑭ ᐊᔑᒋᒥᐢᑭᑲᑌᐠ ᐁ ᒍᓇᐃᑲᑌᐠ ᐧᐊᓯᐧᑲᐱᐢᐠ ᓀᐢᑕ ᒪᑲ ᑲᓚᓇ, ᐊᐡᑭᑯᒪᓇᐱᐢᐠ ᒪᑲ. ᐊᐱᔑᐡ ᓀᐢᑕ ᐃᑕᐧᑲᐣ ᐅᒪ ᒥᔭᐧᐃᐠ ᑲᓇᑕᐧᐁᓂᑕᐧᑲᐠ ᐧᑲᔭᐣᐠ ᑭᒋ ᐊᐸᑎᓯᒪᑲᐠ ᒥᔭᐤ.



RARE EARTH ELEMENTS
ᐁᑲ ᓯᑭ ᑲ ᐃᑕᐧᑲᑭ ᐱᐧᐊᐱᐢᐧᑲ ᐊᐢᑭᐠ

BASTNÄSITE
ᐸᐢᑐᓴᐃᐟ

MONAZITE
ᒍᓇᓴᐃᐟ

Fifteen lanthanide elements and the metals yttrium and scandium make up the group of Rare Earth Elements (REEs). REEs are generally found together in deposits and are abundant in the Earth's crust; however, they do not occur in large concentrations, so are difficult to mine. The world's most abundant REE source is bastnäsite, followed by monazite. REEs are usually high-lustre silver, silvery-white, or grey metals.

ᓂᔭᓄᓴᑊ ᓚᐣᑕᓇᑦ ᑲᐃᒋᑲᑌᑭ ᐱᐧᐊᐱᐢᐧᑲ ᓀᐢᑕ ᒪᑲ ᐃᐟᕆᐊᑦ ᐁᑯ ᒪᑲ ᐢᑲᑎᐊᑦ ᑲᐃᒋᑲᑌᑭ ᐱᐧᐊᐱᐢᐧᑲ ᐁᐧᑲᓂᐃ ᐁᑲ ᓯᑭ ᑲ ᐃᑕᐧᑲᑭ ᐊᐢᑭᐠ. ᐊᑕ ᐁ ᒥᑫᑎᑭ ᑲ ᐃᔑ ᒫᐡᑯᐧᐊᐢᑲᒥᑲᐠ ᒍᓇ ᓇᐢᐱᐨ ᒥᐢᑕᐃ ᐃᑕᐧᑲᓇ, ᐁᐧᑲᓂ ᐧᐃᒋ ᐊᓂᒪᐠ ᑭᒋ ᒍᓇᐃᑲᑌᑭ. ᒪᐧᐊ ᑲ ᒥᑫᑎᐠ ᐅᒪ ᑐᐧᐃ ᐱᐧᐊᐱᐢᐠ ᐁᐧᑲᓂᒪ ᐸᐢᑐᓴᐃᐟ ᐁᑯ ᒪᑲ ᒍᓇᓴᐃᐟ. ᐅᐅ ᐱᐧᐊᐱᐢᐧᑲ ᑭᒋ ᐧᐊᓯᐧᑲᐧᐊ, ᐧᐊᐱ ᐧᐊᓯᐧᑲᐧᐊ ᓀᐢᑕ ᐱᑯ ᐧᐊᐱᑌᐧᐊᐧᐊ ᐊᓂᐃ ᐱᐧᐊᐱᐢᐧᑲ.

YTTRIUM (Y) *Atomic Number: 39*

Yttrium gives a sharp edge to specialty scalpels and needles. Yttrium-stabilized ceramics are used in artificial joints and other prosthetics.

ᐃᐟᕆᐊᑦ - 39 ᑲ ᐃᑕᓯᓇᑌᐠ

ᑭᒋ ᑲᓴᐧᐊ ᒍᑯᒪᓇ ᓀᐢᑕ ᒋᐢᑕᐃᑲᓇ ᐃᐟᕆᐊᑦ ᐱᐧᐊᐱᐢᐠ ᑲ ᐅᒋ ᐅᔑᑕᓂᐧᐊᑭ. ᐁᐧᑲᓂᒪ ᐊᐸᑕᐠ ᐁ ᐅᔑᑕᓂᐧᐊᑭ ᐊᓇᐡᑲᑲᓂᑲᓇ ᓀᐢᑕ ᑯᑕᑭᔭ ᒥᐢᑲᓂᑲᓇ.

LANTHANUM (La) *Atomic Number: 57*

Lanthanum, in the form of lanthanum carbonate, rids the body of excess phosphate in the treatment of hyperphosphatemia (excess phosphate in the blood) and renal failure.

ᓚᐣᑕᓇᑦ - 57 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓚᐣᑕᓇᑦ, ᐁ ᐅᑌᐸᓂᐠ, ᐊᐸᑕᐣ ᐁ ᐧᐃ ᐧᐊᓇᐧᐃᒋᔑᐃᑲᑌᐠ ᑫᐧᑳᐣ ᑊᐊᐢᑊᐁᐟ ᐁ ᐃᒋᑲᑌᐠ ᑫᐧᑳᐣ ᒥᑯᐠ ᐧᐁᓴ ᒥᐢᑕᐃ ᑲ ᐃᑕᐧᑲᐠ ᓀᐢᑕ ᒪᑲ ᒥᑌᑕᐧᑲᓯᐠ

SAMARIUM (Sm) *Atomic Number: 62*

Samarium, in the form of isotope samarium-153, is a radiopharmaceutical used to alleviate pain from cancer that has spread to bone.

ᓴᒪᕆᐊᑦ - 62 ᑲ ᐃᑕᓯᓇᑌᐠ

ᓴᒪᕆᐊᑦ, ᓴᒪᕆᐊᑦ-153 ᑲ ᐃᒋᑲᑌᐠ, ᐊᐸᑕᐣ ᑭᒋ ᓂᑲᐃᑲᑌᐠ ᑲ ᐃᔑ ᐊᑯᐃᑯᓇᓂᐧᐊᐠ ᑲᐟᓯᐢ ᐊᑯᓯᐧᐃᐣ ᒥᐢᑲᓂᐠ ᑲ ᐃᑐᑌᒪᑲᐠ

GADOLINIUM (Gd) *Atomic Number: 64*

Gadolinium has paramagnetic properties that work in compounds injected into the body to enhance contrast when using MRI machines.

ᑲᑐᓕᓂᐊᑦ - 64 ᑲ ᐃᑕᓯᓇᑌᐠ

ᑲᑐᓕᓂᐊᑦ ᑯᑕᐠ ᑫᐧᑳᐟ ᐁ ᑭᓂᑲᐧᐃᓂᑲᑌᐠ ᐁ ᒋᐢᑕᐅᐟ ᐊᐧᐁᓂᑲᐟ ᐧᐃᒋᐃᐧᐁᒪᑲᐟ ᑭᒋ ᐸᓴᑌᓇᐧᑲᐠ ᐁᑦᐊᔅᐊᐃ ᐁ ᔑᐧᐸᒋᑲᑲᓂᐧᐊᐠ.

HOLMIUM (Ho) *Atomic Number: 67*

Holmium is found in solid-state lasers used in medical applications such as tissue ablation, kidney stone removal, and prostate surgery.

ᐅᐟᒥᐊᑦ - 67 ᑲ ᐃᑕᓯᓇᑌᐠ

ᐅᐟᒥᐊᑦ ᐊᐸᑕᐟ ᒪᑲᓯᑲᐠ ᐁ ᐊᐸᑕᐠ ᐣᑐᑯᐃᐧᐁᐧᐃᓂᐠ ᐁ ᒪᓂᔑᑲᑌᐠ ᑫᐧᑲᐟᒥᔭᐧᐃᐠ ᐅᒋ, ᐁ ᐅᑕᐅᒋᐠ ᐊᓯᓂᔭᐠ ᒥᑌᐧᑲᔭᐠ ᐅᒋᐠ, ᓀᐢᑕ ᐱᑯ ᒥᒋᐧᓴᐃᐠ ᒪᒋᔑᑫᐧᐃᐣ

THULIUM (Tm) *Atomic Number: 69*

Thulium is used as a radiation source in portable X-ray devices and for cancer treatment via brachytherapy (implanted radioactive seeds).

ᑐᓕᐊᑦ - 69 ᑲ ᐃᑕᓯᓇᑌᐠ

ᑐᓕᐊᑦ ᐊᐸᑕᐟ ᐁ ᒪᑲᓯᑲᑲᓂᐧᐊᐠ ᑲ ᐸᐸᔑᑕᑕᓂᐧᐊᑲ ᓴᐧᐸᐸᒋᑲᓂ ᐊᐸᒋᑕᐧᐃᓂᐠ ᓀᐢᑕ ᒪᑲ ᐁ ᐧᐃ ᐣᑐᑕᓂᐧᐊᑲ ᑲᐟᓯᐢ ᐊᑯᓯᐧᐃᐣ.

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EDITOR: Victoria Stratton **PROJECT COORDINATOR:** Janice Williams **DESIGN:** TWG Communications **TRANSLATION:** Wintranslation

ᓇᓐᑯᒧᐧᐃᐣ: ᐁ ᒪᓯᓇᐢᑭᑎᑭ ᐱᐧᐊᐱᐢᐧᑲ ᑲ ᑭᐸᑎᓇᑭᐠ ᐅᑯ ᑲᒪᓯᓇᓯᒋᐠ: R. Weller/Cochise College: ᐸᕋᐃᐟ, ᐱᐢᒥᐟ, ᐊᓚᐃᐟ, ᐁᐦᒪᑕᐃᐟ, (ᑭᐢᑭᐧᓇᒋ ᑫᐧᑳᐣ ᑲ ᑭ ᐸᑭᑎᓇᐠ Mineraux et Fossiles),ᑲᓚᐣᓇ, ᑲᓂᔦᐃᐟ,ᑯᐟ, (ᑭᐢᑭᐧᓇᒋ ᑫᐧᑳᐣ ᑲ ᑭ ᐸᑭᑎᓇᐠ John Blennert), (ᒋᑊᓯᑦ/ᓭᓓᓇᐃᐟ, ᒉᐱᑐᓚᐃᐟ, ᐧᒪᓚᑊᑌᓇᐃᐟ, Natural History Museum, Los Angeles), ᐯᐣᓚᐣᑕᐃᐟ, ᑊᓚᑎᓇᑦ, (ᑭᐢᑭᐧᓇᒋ ᑫᐧᑳᐣ ᑲ ᑭ ᐸᑭᑎᓇᐠ John Blennert), ᐸᐃᕈᐠᓗᐟᕆ, (ᑭᐢᑭᐧᓇᒋ ᑫᐧᑳᐣ ᑲ ᑭ ᐸᑭᑎᓇᐠ William Walentiny),ᑲᐧᐊᐟᐢ/ᐊᒥᑎᐢ (ᑭᐢᑭᐧᓇᒋ ᑫᐧᑳᐣ ᑲ ᑭ ᐸᑭᑎᓇᐠ Belkis Minerals), ᔑᓚᐃᐟ, ᐢᑊᐊᓚᐃᐟ, ᐢᐳᑐᒥᓂ, ᓴᐟᑊᐅᐢ (ᑭᐢᑭᐧᓇᒋ ᑫᐧᑳᐣ ᑲ ᑭ ᐸᑭᑎᓇᐠ Robert ᐁᑯ ᒪᑲ Catherine Sanders), Sylvite Rob Lavinsky/www.iRocks.com/Arkenstone: ᐸᐢᑐᓴᐃᐟ, ᑲᓯᑌᕆᐃᐟ, ᒐᐟᑯᑊᐸᐃᐟ, ᒍᓇᓴᐃᐟ, ᕈᑕᐃᐟ Maggie Wilson: ᔪᑫᓂᓇᐃᐟ
ᒪᓯᓇᐃᑫᐧᐃᓂᓂᐤ ᑲ ᓇᓇᑲᒋᑕᐟ ᑊᐯᐢᑐᓇ ᐢᑫᑎᐣ ᐊᑎᓯᐧᐃᓂᓂᐤ ᑲ ᓇᓇᑲᒋᑕᐟ ᒐᓂᐢ ᐧᐃᓕᔭᒼᐢ ᐧᐊᐁᓇᓯᓂᐃᑫᐧᐃᐣ: TWG Communications ᑲ ᑭ ᐧᑫᐢᑲᓯᓇᐊᐠ: Wintranslation