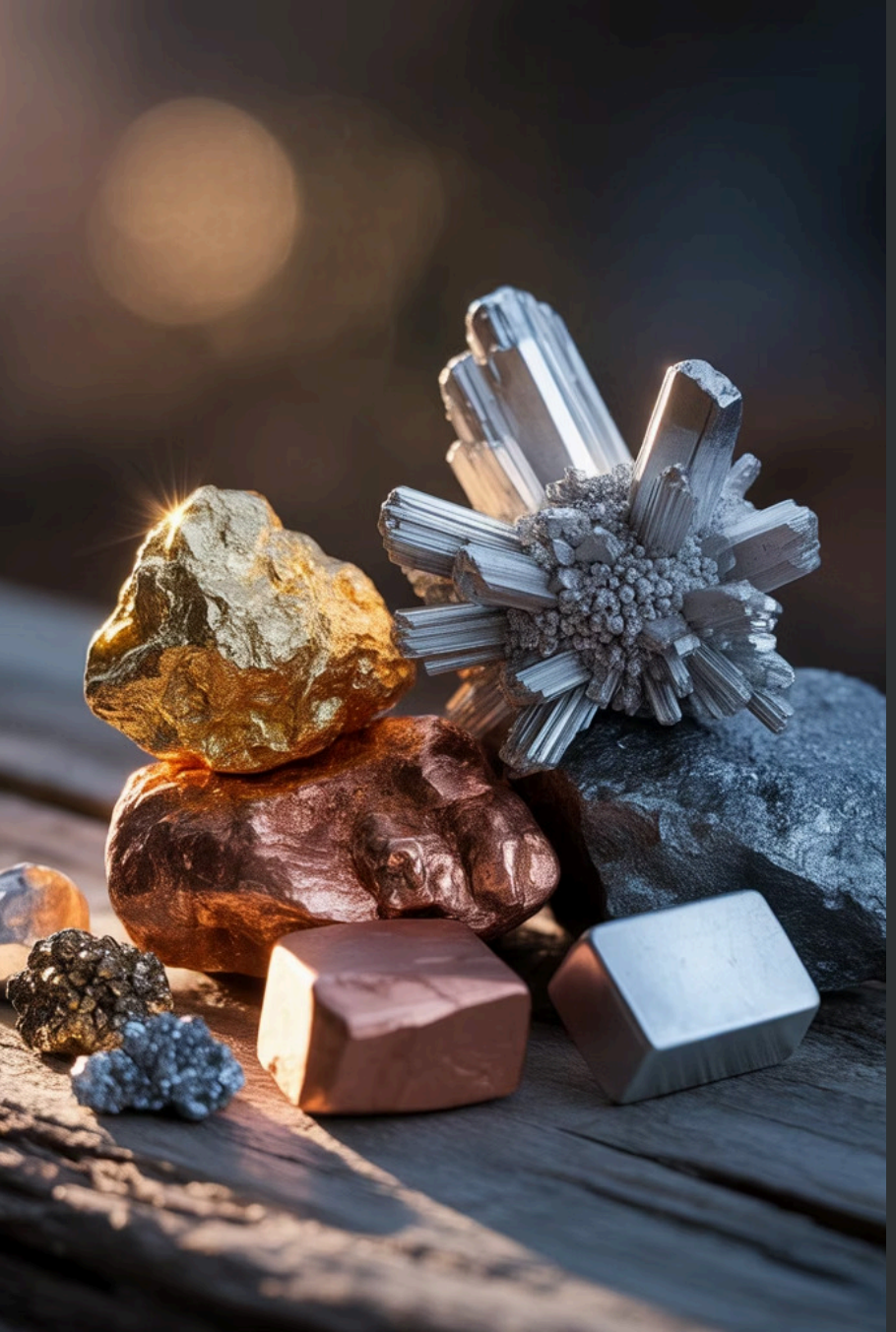

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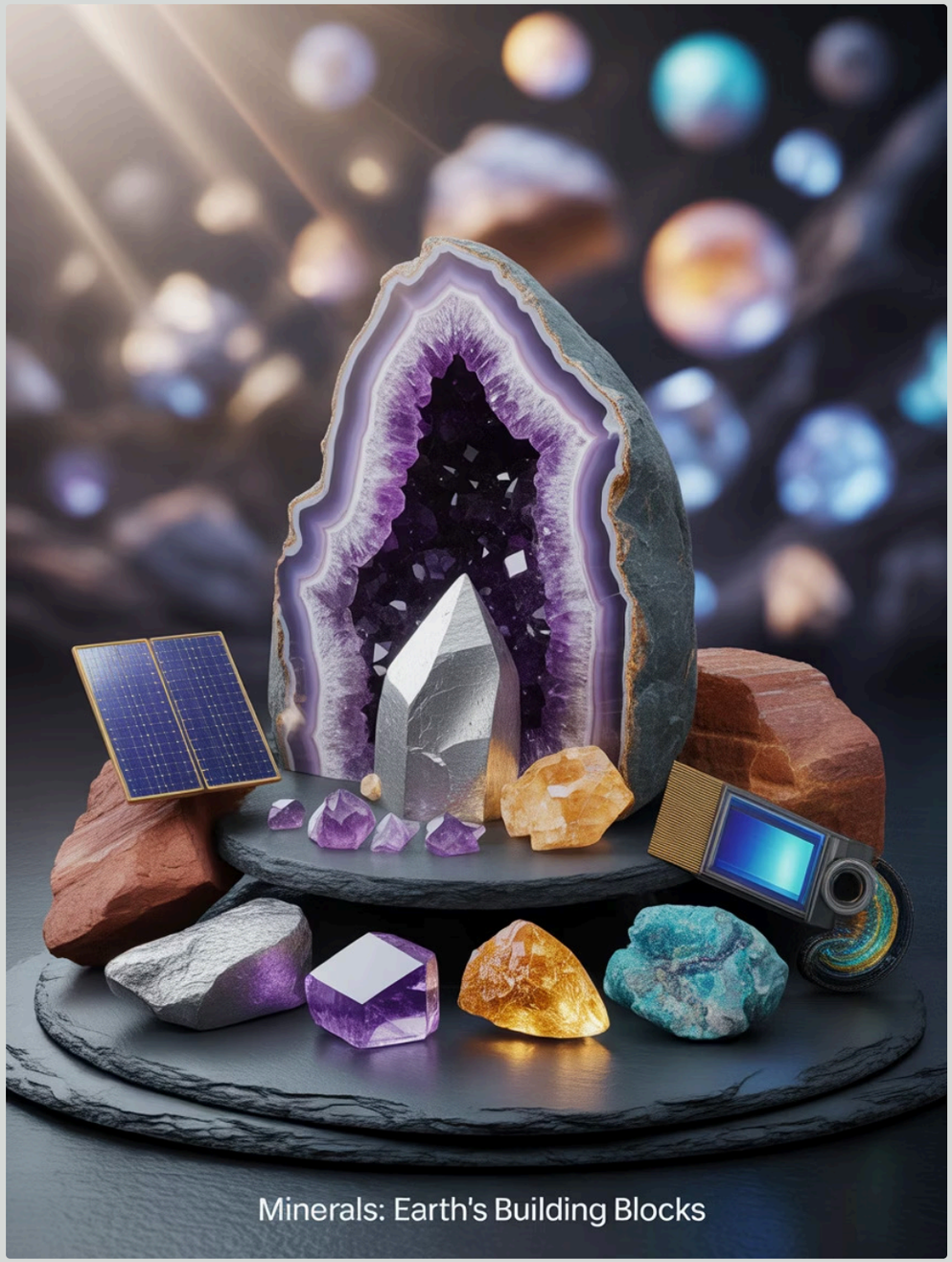
Mineral Catalogue: Classification and Main Characteristics

A detailed guide on the main categories of minerals and their importance in industry and nature.



GENERAL INTRODUCTION

Minerals are natural inorganic substances with a defined chemical composition and crystalline structure.

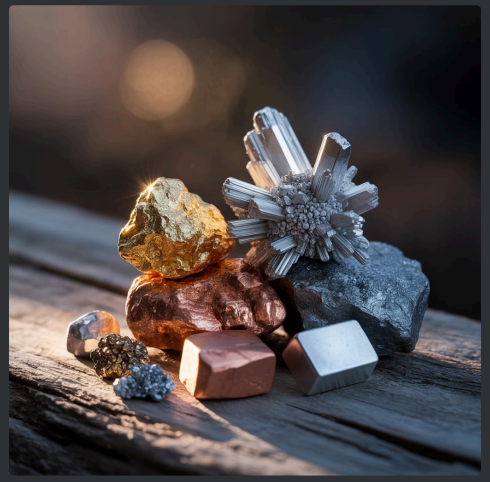
Their study is fundamental not only for geology but also for multiple industries such as construction, electronics, energy, and medicine.

This catalogue presents a detailed classification of minerals into four main groups: **metallic, non-metallic, energy, and crystalline.**

Each possesses unique characteristics, specific applications, and a key role in the economic and technological development of the modern world.

MINERAL PRODUCTS CATALOGUE

High-quality mineral solutions for international markets, with detailed technical specifications and a comprehensive coding system to facilitate global commercialisation.

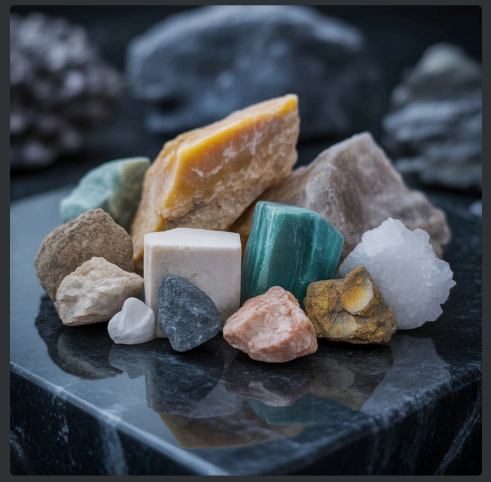


1 [MT]

Metallic Minerals

10 Categories

33 Products

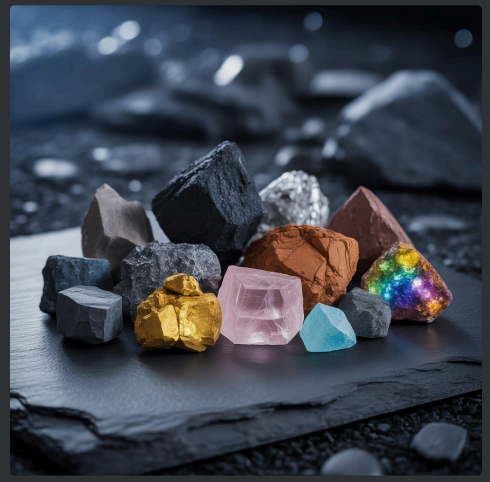


2 [NM]

Non-Metallic Minerals

5 Categories

12 Products

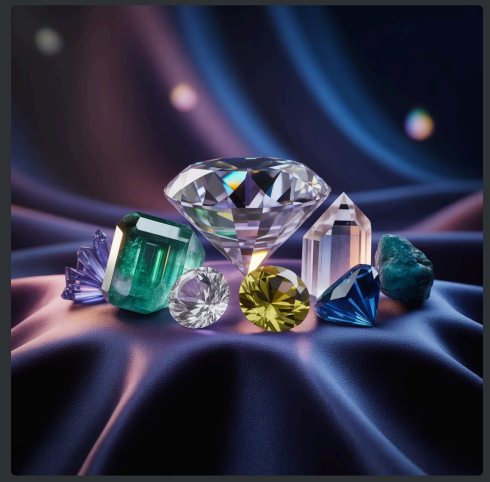


3 [EN]

Energy Minerals

5 Categories

16 Products



4 [CR]

Crystalline Minerals

5 Categories

24 Products

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1. METALLIC MINERALS [MT]

Introduction

Metallic minerals are those that contain chemical elements with the characteristic properties of metals, such as conductivity, ductility, malleability, and lustre. They are essential for the manufacture of infrastructure, machinery, technology, and transport.

Key Points:

1. Origin and Extraction: They are generally found in veins or magmatic and hydrothermal deposits, obtained through underground or open-cast mining.

2. Industrial Applications: They form the basis for the production of steel, aluminium, copper, zinc, among others, used in construction, telecommunications, and automotive industries.

3. Notable Examples: Iron (Fe), copper (Cu), aluminium (Al), and gold (Au).

4. Environmental Impact: Their extraction can generate significant impacts, which is why responsible and sustainable mining is promoted.

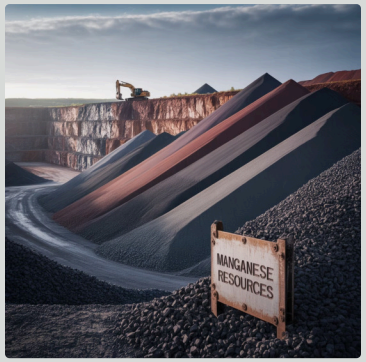
1. METALLIC MINERALS [MT]

MT01

Iron and derivatives

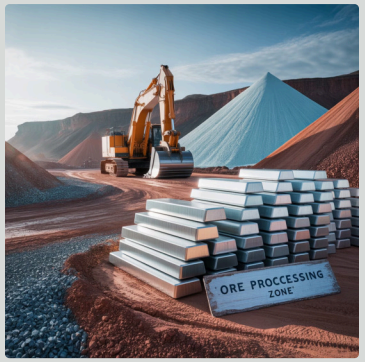
MT02

Bauxite and aluminium



MT03

Manganese



MT04

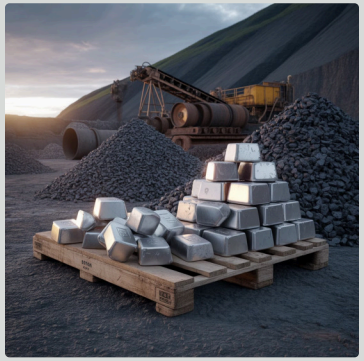
Nickel

MT05

Copper

MT06

Gold and Silver



MT07

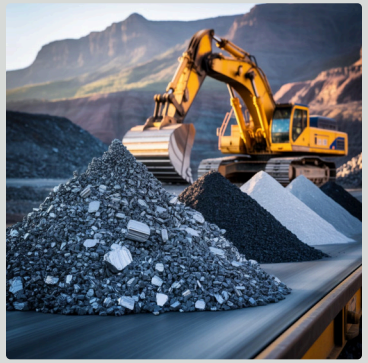
Tin and Cassiterite

MT08

Niobium

MT09

Zinc



MMT10

Lead and Titanium

1. METALLIC MINERALS [MT] I

MT01 Iron and derivatives

1. MT01001A High-grade iron ore (>65% Fe)
2. MT01001B Medium-grade iron ore (60-65% Fe)
3. MT01001C Low-grade iron ore (<60% Fe)
4. MT01002A Iron pellets
5. MT01002B Iron concentrate

MT02 Bauxite and aluminium

1. MT02001A Metallurgical grade bauxite
2. MT02001B Non-metallurgical grade bauxite
3. MT02002A Calcined alumina

MT03 Manganese

1. MT03001A High-grade manganese ore (>48% Mn)
2. MT03001B Medium-grade manganese ore (42-48% Mn)
3. MT03001C Low-grade manganese ore (<42% Mn)

MT04 Nickel

1. MT04001A Sulphide nickel ore
2. MT04001B Lateritic nickel ore
3. MT04002A Ferronickel

MT05 Copper

1. MT05001A High-grade copper concentrate (>30% Cu)
2. MT05001B Standard-grade copper concentrate (24-30% Cu)
3. MT05001C Low-grade copper concentrate (<24% Cu)
4. MT05002A Copper cathodes

1. METALLIC MINERALS [MT] II

MT06 Gold and Silver	MT07 Tin and Cassiterite	MT08 Niobium	MT09 Zinc, Lead and Titanium	MT10 Lead and Titanium
1. MT06001A Doré (gold-silver alloy) 2. MT06002A Gold concentrate 3. MT06003A Refined silver 4. MT06003B Silver concentrate	1. MT07001A High-grade cassiterite concentrate (>60% Sn) 2. MT07001B Standard-grade cassiterite concentrate (45-60% Sn) 3. MT07002A Metallic tin	1. MT08001A Pyrochlore concentrate 2. MT08001B Ferroniobium	1. MT09001A High-grade zinc concentrate (>55% Zn) 2. MT09001B Standard-grade zinc concentrate (45-55% Zn)	1. MT09002A High-grade galena concentrate (>65% Pb) 2. MT09002B Standard-grade galena concentrate (50-65% Pb) 3. MT09003A Ilmenite concentrate (titanium) MT09003B Rutile (titanium)

2. NON-METALLIC MINERALS [NM]

Introduction

Non-metallic minerals do not possess the typical properties of metals, but are equally valuable. They are widely utilised in sectors such as agriculture, the chemical industry, and construction.

Key Points:

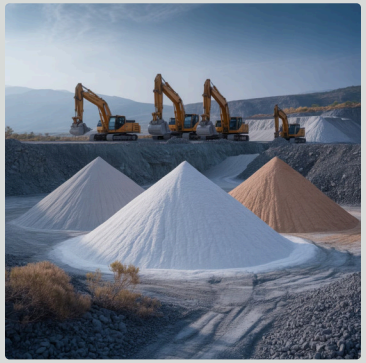
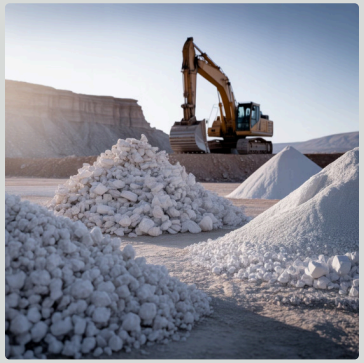
1. Physical Characteristics: They usually have low thermal and electrical conductivity, more varied colours, and a dull or vitreous appearance.

2. Common Uses: These include fertilisers (such as potash), construction materials (such as gypsum and lime), and components in electronic products (such as silicon).

3. Extraction and Processing: They are primarily obtained through surface mining, followed by crushing, grinding, and purification processes.

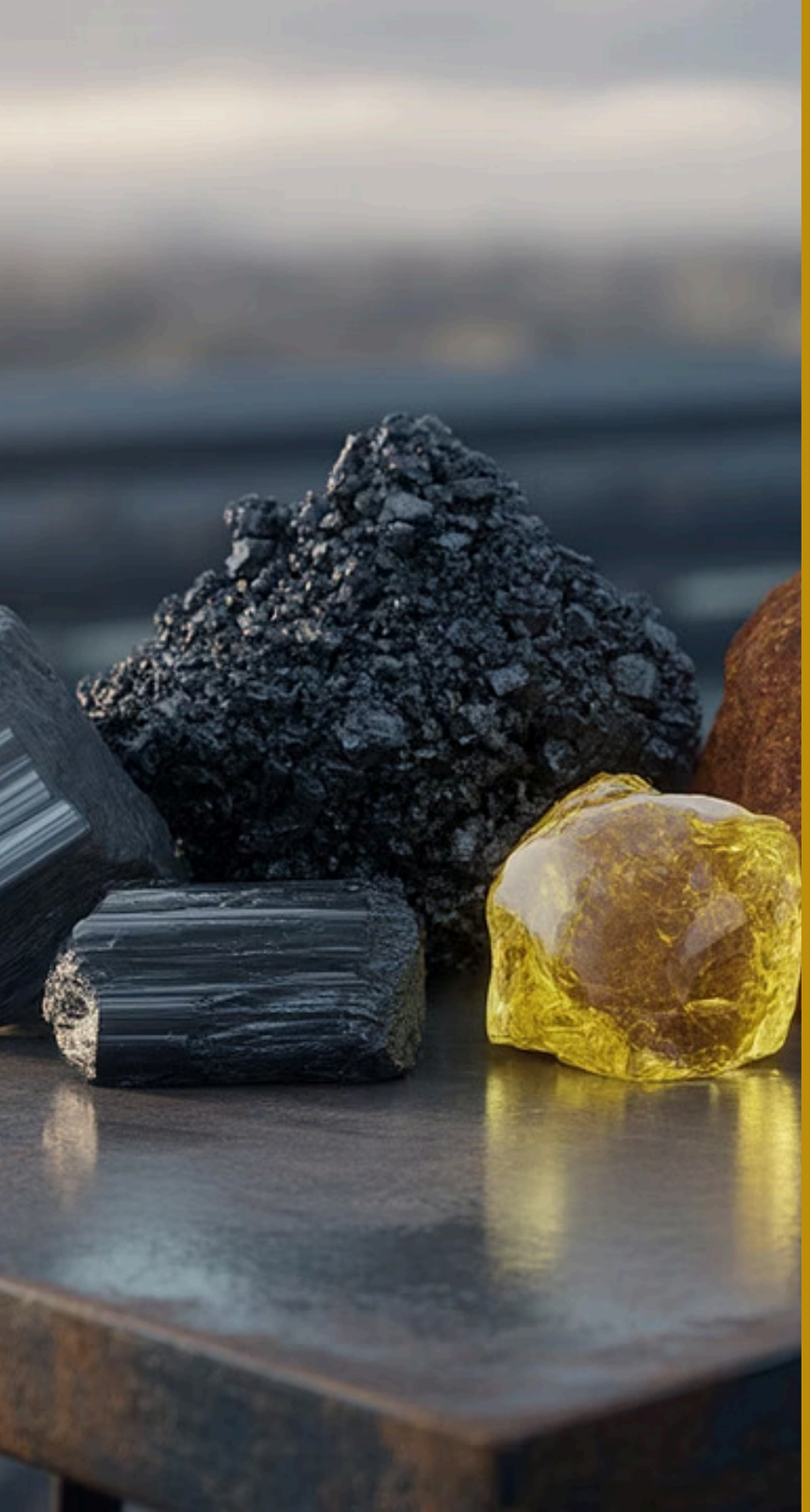
4. Sustainability: Their efficient use contributes to reducing dependence on metallic and fossil resources.

2. NON-METALLIC MINERALS [NM]

				
NM01	**NM02**	**NM03**	**MN04**	**MN05**
Limestone	Phosphate	Kaolin	Gypsum	Rock Salt

2. NON-METALLIC MINERALS [NM]

NM01 Limestone	NM02 Phosphate	NM03 Kaolin	NM04 Gypsum	NM05 Rock Salt
1. NM01001A High-purity Limestone (>98% $CaCO_3$)	1. NM02001A High-grade Phosphate Rock (>32% P_2O_5)	1. NM03001A Ceramic-grade Kaolin	1. NM04001A High-purity Natural Gypsum (>95% $CaSO_4 \cdot 2H_2O$)	1. NM05001A High-purity Industrial Salt
2. NM01001B Standard Limestone (90-98% $CaCO_3$)	2. NM02001B Medium-grade Phosphate Rock (28-32% P_2O_5)	2. NM03001B Paper-grade Kaolin	2. NM04001B Standard Natural Gypsum (85-95% $CaSO_4 \cdot 2H_2O$)	2. NM05001B De-icing Salt
3. NM01002A Quicklime	3. NM02001C Low-grade Phosphate Rock (<28% P_2O_5)	3. NM03001C Industrial-grade Kaolin	3. NM04002A Calcined Gypsum (Plaster of Paris)	3. NM05001C Water Treatment Salt
4. NM01002B Hydrated Lime				



3. ENERGY MINERALS [EN]

Introduction

Energy minerals are those whose transformation generates usable energy, whether thermal, electrical, or even nuclear. They have been fundamental in driving global industrialisation and technological development.

Key points:

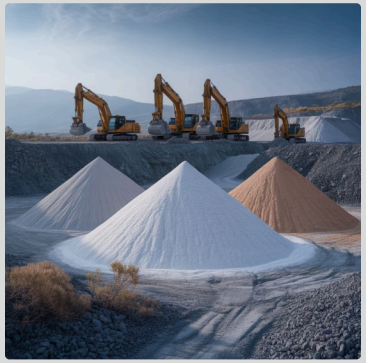
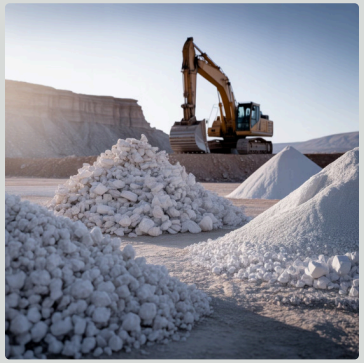
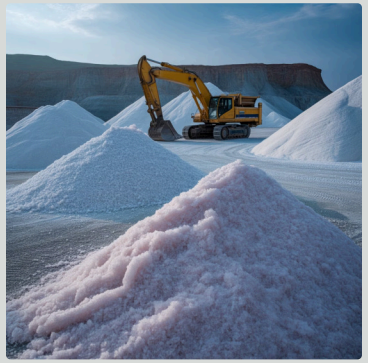
1. Main types: These include coal, petroleum (although technically not a mineral, it is considered here due to its mineral origin), natural gas, and uranium.

2. Energy generation: Coal and uranium are used in thermal power and nuclear power plants, respectively, while natural gas powers electrical turbines.

3. Energy transition: Despite their historical significance, their use is gradually being replaced by renewable sources due to their environmental impact.

4**. Global reserves:** Reserves are limited, and their exploitation requires responsible management policies and strategic planning.

3. ENERGY MINERALS [EN]

				
EN01	**EN02**	**EN03**	**EN04**	**EN05**
Coal	Uranium	Monazite	Lithium	Rare Earths

3. ENERGY MINERALS [EN]

EN01 Coal

1. EN01 Coal
2. EN01001A Anthracite
3. EN01001B Bituminous Coal
4. EN01001C Sub-bituminous Coal
5. EN01001D Lignite
6. EN01002A Metallurgical Coke

EN02 Uranium

1. EN02001A Uranium Concentrate (U_3O_8) - Yellow cake
2. EN02001B Natural Uranium (UO_2)

EN03 Monazite

1. EN03001A High-grade Monazite Concentrate
2. EN03001B Standard Monazite Concentrate

EN04 Lithium

1. EN04001A High-grade Spodumene Concentrate (>6% Li_2O)
2. EN04001B Standard Spodumene Concentrate (4-6% Li_2O)
3. EN04002A Battery-grade Lithium Carbonate
4. EN04002B Lithium Hydroxide

EN05 Rare Earths

1. EN05001A Light Rare Earth Concentrate
2. EN05001B Heavy Rare Earth Concentrate
3. EN05002A Separated Rare Earth Oxides

4. CRYSTALLINE MINERALS [CR]

Introduction

Crystalline minerals are distinguished by having an ordered internal structure that manifests externally in defined geometric forms. They have both aesthetic and technological applications, especially in electronics and optics.

Key points:

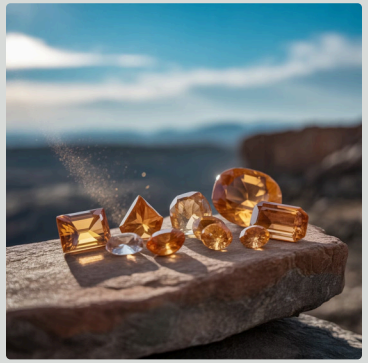
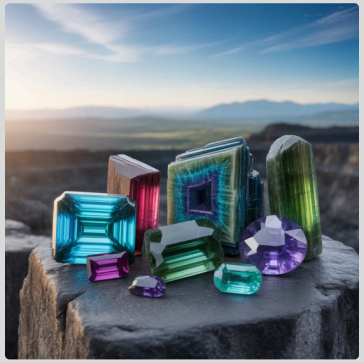
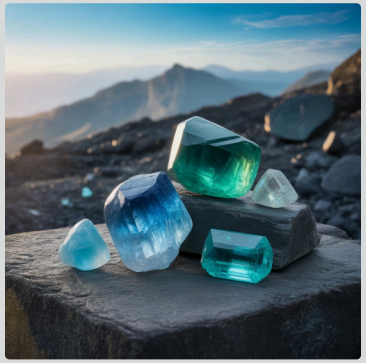
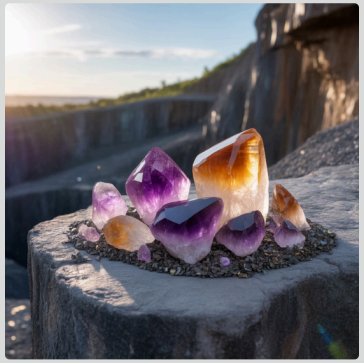
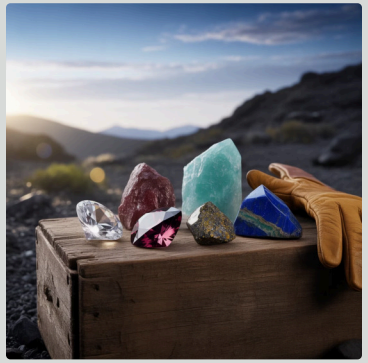
1. Formation and structure: They form under specific conditions of temperature and pressure, developing unique crystal lattices.

2. Industrial uses: They are key in the manufacturing of integrated circuits (such as quartz), lenses (such as fluorite) and jewellery (such as diamond and ruby).

3. Optical and electrical properties: Many possess piezoelectricity, special transparency, or selective conductivity.

4. Ornamental value: Some are highly valued as gemstones, combining beauty and rarity, which increases their commercial value.

4. CRYSTALLINE MINERALS [CR]

				
CR01	**CR02**	**CR03**	**CR04**	**CR05**
Imperial Topaz	Tourmaline	Beryl	Quartz	Diamond and others

4. CRYSTALLINE MINERALS [CR]

CR01 Imperial Topaz

1. CR01001A Imperial Topaz gem quality
2. CR01001B Imperial Topaz facet-grade quality
3. CR01001C Imperial Topaz collector's quality

CR02 Tourmaline

1. CR02001A Paraíba Tourmaline superior quality
2. CR02001B Paraíba Tourmaline medium quality
3. CR02002A Rubellite Tourmaline
4. CR02002B Indicolite Tourmaline
5. CR02002C Verdelite Tourmaline

CR03 Beryl

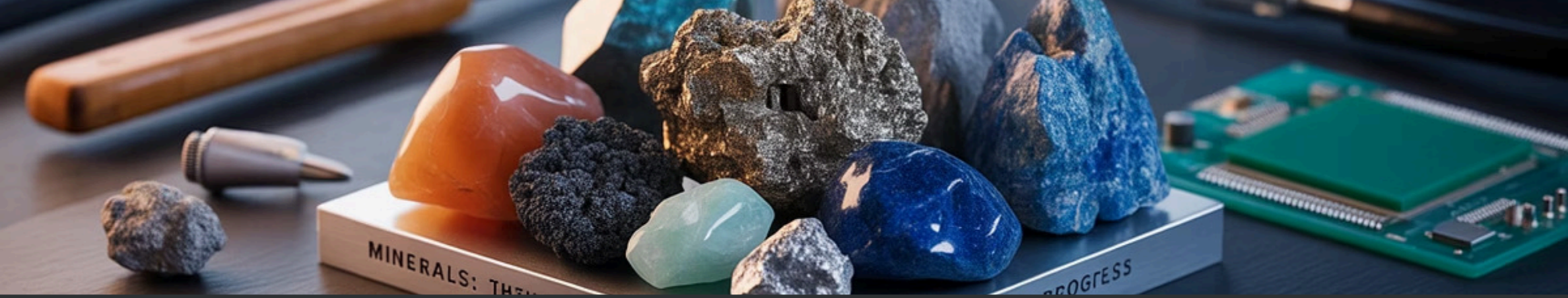
1. CR03001A Aquamarine AAA quality
2. CR03001B Aquamarine AA quality
3. CR03001C Aquamarine A quality
4. CR03002A Emerald AAA quality
5. CR03002B Emerald AA quality
6. CR03002C Emerald A quality

CR04 Quartz

1. CR04001A Amethyst gem quality
2. CR04001B Amethyst ornamental quality
3. CR04002A Natural Citrine gem quality
4. CR04002B Treated Citrine gem quality

CR05 Diamond and others

1. CR05001A Diamond gem quality
2. CR05001B Industrial Diamond
3. CR05002A Garnet
4. CR05002B Spinel
5. CR05002C Andalusite
6. CR05002D Lapis Lazuli



Conclusion

This catalogue provides an understanding of the diversity and functionality of minerals according to their classification. Each category has a specific role in human and technological development, as well as challenges related to their extraction and sustainability.

Key Conclusion Points:

1. Economic Importance: Minerals are cornerstones of multiple industries and drivers of national and international development.

2. Diversity of Uses: From construction to electronics, including healthcare and decoration, their versatility is irreplaceable.

3. Environmental Responsibility: It is crucial to adopt responsible mining practices that minimise ecological impact.

4. Future of Mining: Innovation and the transition towards clean energies are redirecting the use of minerals towards more sustainable and efficient models.

Contact Us

Thank you for exploring our comprehensive mineral catalogue. We are available to assist with any specific enquiries regarding products, availability, or industrial applications.

Please contact us to request samples or personalised quotations tailored to your specific requirements.

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