

# Ore

## 1. Ore mineralogy

**ID and name:** OO1 material\_ore\_mineralogy

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** The mineralogical composition of the ore.

*with the two subproperties:*

### 1.1 Minerals

**ID and name:** OO1.1 material\_ore\_mineralogy\_mineral

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The minerals included in the specimen.

*with the two subproperties:*

#### 1.1.1 Mineral name

**ID and name:** OO1.1.1 material\_ore\_mineralogy\_mineral\_name

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** Name of the mineral approved by the International Mineralogical Association (IMA).

**Allowed values and other constraints:** controlled vocabulary ([IMA list of minerals](#)), retrieved from the Mindat API

#### 1.1.2 Mineral ID

**ID and name:** OO1.1.2 material\_ore\_mineralogy\_mineral\_id

**Provided by:** Mindat API

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The Mindat ID of the mineral.

**Allowed values and other constraints:** Value in the `id` field of a Mindat mineral record.

## 1.2 Mineral–hosting ore part

**ID and name:** OO1.2 material\_ore\_mineral\_part

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The part of the ore to which the mineral belongs to.

**Allowed values and other constraints:** controlled vocabulary

## 2. Commodity

**ID and name:** OO2 material\_ore\_commodity

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** Information about the targeted metal(s) by mining activities through time.

*with the two subproperties:*

### 2.1 Targeted metals

**ID and name:** OO2.1 material\_ore\_commodity\_metal

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The target metal(s) of the mining activities.

**Allowed values and other constraints:** controlled vocabulary

### 2.2 Period of extraction

**ID and name:** OO2.2 material\_ore\_commodity\_period

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** Period when the mine was exploited for the metals listed in [002.1 Targeted metals](#).

*with the eight subproperties:*

#### 2.2.1 Persistent identifier

**ID and name:** B3.1 date\_pid

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

*with the two subproperties:*

##### 2.2.1.1 VALUE

**ID and name:** B3.1.1 date\_pid\_value

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The value of the persistent identifier.

**Allowed values and other constraints:** The period's persistent identifier in one or more of the data infrastructures listed in `B3.1.2 Type`.

**Example:** 99152/p0qhb66vvth

#### 2.2.1.2 TYPE

**ID and name:** B3.1.2 date\_pid\_type

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The name of the data infrastructure.

**Allowed values and other constraints:** controlled vocabulary

#### 2.2.2 Date type

**ID and name:** B3.2 date\_type

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** Is this an archaeological or geological age? Archaeological dates must be given in calendar years, with BCE dates as negative values. Geological dates must be given in million years.

**Allowed values and other constraints:** geological, archaeological

**Example:** archaeological

#### 2.2.3 Absolute Date

**ID and name:** B3.3 date\_absolute

**Provided by:** data provider, API

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** The absolute date of a point in time or period in years before or after common era. Values in BCE are reported as negative values. If the absolute date is given with an uncertainty such as 450 +/- 50 BC, start and end date mark the lower and upper limit of the date range, i.e. -500 and -400.

*with the four subproperties:*

##### 2.2.3.1 START

**ID and name:** B3.3.1 date\_absolute\_start

**Provided by:** data provider, API

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The oldest possible date of the period.

**Allowed values and other constraints:** integer

**Example:** -15

##### 2.2.3.2 END

**ID and name:** B3.3.2 date\_absolute\_end

**Provided by:** data provider, API

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** The youngest possible date of the period.

**Allowed values and other constraints:** integer

**Example:** 15

#### 2.2.3.3 DATING METHOD

**ID and name:** B3.3.3 date\_absolute\_method

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The method used to determine the absolute date.

**Allowed values and other constraints:** controlled vocabulary

#### 2.2.3.4 UNIT OF DATE

**ID and name:** B3.3.4 date\_absolute\_unit

**Provided by:** TerraLID system

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The unit of the date.

**Allowed values and other constraints:** a, Ma

**Example:** a

### 2.2.4 Relative Date

**ID and name:** B3.4 date\_relative

**Provided by:** data provider, API

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** The relative date of a point in time or period.

*with the two subproperties:*

#### 2.2.4.1 CHRONOLOGICAL UNIT

**ID and name:** B3.4.1 date\_relative\_period

**Provided by:** data provider, API

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The relative date expressed as a chronological unit.

**Allowed values and other constraints:** controlled vocabulary

#### 2.2.4.2 DATING METHOD

**ID and name:** B3.4.2 date\_relative\_method

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The method used to determine the relative date.

**Allowed values and other constraints:** controlled vocabulary

### 2.2.5 Cultural unit

**ID and name:** B3.5 date\_archaeo\_cultural

**Provided by:** data provider

**Obligation:** optional

**Occurrences:** 0–n

**Definition:** Relevant cultural and user created labels for the relative date of the item.

**Allowed values and other constraints:** free text, only available if B3.2 Date type = "archaeological".

**Example:** Roman

### 2.2.6 Orogenesis

**ID and name:** B3.6 date\_geol\_orogenesis

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** The relative date expressed as anorogenic event.

**Allowed values and other constraints:** controlled vocabulary, only available if B3.2 Date type = "geological".

### 2.2.7 Definition of chronological unit

**ID and name:** B3.7 date\_relative\_reference

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** The reference defining the relative date or period.

*with the five subproperties:*

#### 2.2.7.1 Persistent Identifier

**ID and name:** B5.1 relation\_pid

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** The persistent identifier or TerraLID ID associated with a resource or related research output. If referring to another entity in the TerraLID database, the TerraLID identifier must be used.

*with the two subproperties:*

##### # 2.2.7.1.1 Value

**ID and name:** B5.1.1 relation\_pid\_value

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** Value of the persistent identifier or TerraLID ID.

**Allowed values and other constraints:** valid persistent identifier according to the options listed in [B5.1.2 Type](#).

**Example:** 10.60510/ICDP5054ESYI201

#### # 2.2.7.1.2 Type

**ID and name:** B5.1.2 relation\_pid\_type

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The type of the identifier.

**Allowed values and other constraints:** controlled vocabulary

#### 2.2.7.2 Full reference

**ID and name:** B5.2 relation\_text

**Provided by:** data provider, API (DOI)

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** The full reference of a publication.

**Allowed values and other constraints:** free text

**Example:** Palinkaš, L. A., 1985, Lead isotope patterns in galenas from some selected ore deposits in Croatia and NW Bosnia, Geološki Vjesnik, 38, 175–89.

#### 2.2.7.3 Kind of relation

**ID and name:** B5.3 relation\_kind

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** Relationship between item and the research output.

**Allowed values and other constraints:** controlled vocabulary

#### 2.2.7.4 Type of resource

**ID and name:** B5.4 relation\_resource

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** Type of resource or research output.

**Allowed values and other constraints:** controlled vocabulary

#### 2.2.7.5 Additional details

**ID and name:** B5.5 relation\_detail

**Provided by:** data provider

**Obligation:** optional

**Occurrences:** 0–n

**Definition:** Additional information about the relation, e.g., if the related work addresses a specific aspect of the item

(e.g., the geological setting).

**Allowed values and other constraints:** free text

**Example:** Information about the dating of the site.

### 3. Mineralisation

**ID and name:** OO3 material\_ore\_mineralisation

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** Information about the mineralisation of the ore.

*with the two subproperties:*

#### 3.1 Mineralisation type

**ID and name:** OO3.1 material\_ore\_mineralisation\_type

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** The type of fabric to which the mineral belongs to.

**Allowed values and other constraints:** controlled vocabulary

#### 3.2 Mineralisation phase

**ID and name:** OO3.2 material\_ore\_mineralisation\_phase

**Provided by:** data provider

**Obligation:** optional

**Occurrences:** 0–1

**Definition:** The relative position in the sequence of events forming the ore deposit with 1 being the earliest mineralisation event.

**Allowed values and other constraints:** integer

**Example:** 2

### 4. Ore chemistry

**ID and name:** OO4 material\_ore\_chemistry

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** Information about the chemical composition of the ore.

*with the two subproperties:*

#### 4.1 Chemical composition

**ID and name:** OO4.1 material\_ore\_chemistry\_element

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The chemical composition of the ore.

*with the eight subproperties:*

#### 4.1.1 Analytical method

**ID and name:** B4.1 chemistry\_method

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The method used to determine the chemical composition.

**Allowed values and other constraints:** controlled vocabulary

#### 4.1.2 Analysed compound

**ID and name:** B4.2 chemistry\_compound

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The analysed chemical compound (chemical element or oxide).

**Allowed values and other constraints:** controlled vocabulary, not available if a mass spectrometric-method is recorded in `B4.1 Analytical method`.

#### 4.1.3 Analysed isotope

**ID and name:** B4.3 chemistry\_icp\_isotope

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** The isotope used for quantification of a chemical element.

**Allowed values and other constraints:** controlled vocabulary, only available if a mass spectrometric-method is recorded in `B4.1 Analytical method`.

#### 4.1.4 Value

**ID and name:** B4.4 chemistry\_value

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The concentration of the analysed chemical compound.

**Allowed values and other constraints:** decimal number

**Example:** 15.3

#### 4.1.5 Unit



**ID and name:** B4.5 chemistry\_unit

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The unit in which the concentration of the analysed chemical compound is given.

**Allowed values and other constraints:** controlled vocabulary

#### 4.1.6 Uncertainty type

**ID and name:** B4.6 chemistry\_uncertainty\_type

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** The type of analytical uncertainty.

**Allowed values and other constraints:** controlled vocabulary

#### 4.1.7 Confidence level

**ID and name:** B4.7 chemistry\_uncertainty\_sigma

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** Sigma value of the reported absolute analytical uncertainty.

**Allowed values and other constraints:** 1, 2, 3

**Example:** 2

#### 4.1.8 Uncertainty value

**ID and name:** B4.8 chemistry\_uncertainty\_value

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–n

**Definition:** Value of the absolute analytical uncertainty.

**Allowed values and other constraints:** decimal number

**Example:** 0.3

### 4.2 Abundance category

**ID and name:** OO4.2 material\_ore\_chemistry\_category

**Provided by:** TerraLID system

**Obligation:** mandatory

**Occurrences:** 1–n

**Definition:** The abundance category of each element inferred from the chemical composition.

**Allowed values and other constraints:** controlled vocabulary

## 5. Alteration

**ID and name:** OO5 material\_ore\_alteration

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 1

**Definition:** The extent of alteration.

**Allowed values and other constraints:** controlled vocabulary

## 6. Deposit type

**ID and name:** OO6 material\_ore\_deposit

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** The type of the ore deposit.

**Allowed values and other constraints:** controlled vocabulary

## 7. Ore district

**ID and name:** OO7 material\_ore\_district

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** The mining district the ore deposit belongs to.

**Allowed values and other constraints:** free text

**Example:** Mitterberg; Laurion; African Copper Belt

## 8. Access to targeted metal

**ID and name:** OO8 material\_ore\_accessibility

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** Information about whether the ore was accessible with pre–industrial mining and/or smelting technology?

*with the two subproperties:*

### 8.1 Accessibility

**ID and name:** OO8.1 material\_ore\_accessibility

**Provided by:** data provider

**Obligation:** recommended

**Occurrences:** 0–1

**Definition:** Was the ore accessible for pre–industrial societies?

**Allowed values and other constraints:** yes, no

**Example:** yes

## 8.2 Details

**ID and name:** OO8.2 material\_ore\_accessibility\_detail

**Provided by:** data provider

**Obligation:** mandatory

**Occurrences:** 1

**Definition:** If [008.1 Accessibility](#) is provided, short explanation for choice.

**Allowed values and other constraints:** free text

**Example:** The ore is part of the gossan and can be smelted in prehistoric furnaces.