## CHECK-LIST FOR NEW-MINERAL PROPOSALS (2018) (Times New Roman, Regular, 12 pts, single spaced)

## CONFIDENTIAL INFORMATION

**DEADLINE 1: XX XXXX 202X**

DEADLINE 2: XX XXXX 202X

**NOTE:Wherever numerical data are to be entered, the spaces are followed by brackets. Please give estimated errors or estimated standard deviations in the brackets. For example, *a* 12.345(9).**

# GENERAL INFORMATION

**2023-XXX** Mineral name (***specify***)

Ideal chemical formula: (***specify***)

Crystal system: (***specify***) Space group: (***specify***)

Point group: (***specify, if space group is unknown***)

*a* = ( ) Å *b =* ( ) Å *c* = ( ) Å

*α* = ( )° *β* = ( )° *γ* = ( )°

*V* = ( ) Å3 *Z* =

IUCr recommend giving 2-digit standard uncertainties such as 10,11,12……19.

AUTHORS' NAMES AND **COMPLETE** ADDRESS (***also e-mail for the corresponding author***):

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**OCCURRENCE**

Give specific details on the **geographic locality**. In cases of remote localities, please give **latitude and longitude**.

**Associated minerals** (***give a complete list***)

**Origin of the mineral** (***give any information on how the mineral was formed***)

# APPEARANCE and PHYSICAL PROPERTIES

***Give a short description including the kind of crystals or grains, the kind of aggregates, the size of individual grains or crystals (in metric units) and the size of aggregates.***

Colour: (**specify megascopic colour**)

Streak: (**specify *colour of the powder***)

Lustre: vitreous / adamantine / metallic or other *(****specify***) ; opaque / translucent or transparent (***specify***)

Fluorescence: (***give colours and wavelengths of excitation***)

Hardness (Mohs) = X(***specify***)

Hardness (Micro-indentation): VHN load in g; mean and range (in kg/mm2)

Cleavage: (***give directions and perfection***)

Parting: (***give directions and perfection***)

Tenacity: brittle / sectile / malleable or other (***specify***)

Fracture: uneven / conchoidal / splintery or other (***specify***)

Density (meas.) = ( ) g·cm-3 Method used to measure density: (***specify***); **(if not measured give reason(s))**

Density (calc.) = ( ) g·cm-3

Magnetic properties:

**OTHER PROPERTIES**

***Thermal/Infrared/Raman/Mössbauer spectroscopy/NMR/EELS/EXAFS or other (specify and describe the results).***

**OPTICAL PROPERTIES**

*TRANSPARENT/TRANSLUCENT MINERALS****:***

***(Give estimated errors) specify WAVELENGTH in nm.***

Isotropic: *n* = ( )

Uniaxial (+) (−): ω = ( ), ε = ( )

Biaxial (+) (−): α = ( ), β = ( ), γ = ( )

2V (meas.) = ( )º

2V (calc.) = ( )º

Dispersion: r > v or r < v; strong/medium or weak (***specify***)

Orientation: (***As complete as possible***)

Pleochroism: O = , E = ; E>O or E<O;

X = , Y = , Z = ; X>Y>Z or other (***specify***)

*OPAQUE MINERALS: In reflected light*

Colour: (***specify in microscope***)

Bireflectance:

Pleochroism:

Anisotropy:

Internal reflections:

Reflectance values:

Reference material: ***(specify)*** ***(It should be one of those recommended by the Commission on Ore Mineralogy, I.M.A.).***

Measured in air? yes ..... no .....

Measured in oil? yes ..... no ..... (refractive index of oil: ..................)

For multiple R values, please indicate: Rmax./Rmin., RO/RE, etc.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rmax | Rmin |  (nm) |  | Rmax | Rmin | (nm) |
|  |  | 400 |  |  |  | 560 |
|  |  | 420 |  |  |  | 580 |
|  |  | 440 |  |  |  | 589 (COM) |
|  |  | 460 |  |  |  | 600 |
|  |  | 470 (COM) |  |  |  | 620 |
|  |  | 480 |  |  |  | 640 |
|  |  | 500 |  |  |  | 650 (COM) |
|  |  | 520 |  |  |  | 660 |
|  |  | 540 |  |  |  | 680 |
|  |  | 546 (COM) |  |  |  | 700 |

OTHER OPTICAL DATA: (specify)

**CHEMICAL DATA**

Type of analysis: Wet/ Electron Microprobe/ Other (***specify***)

***Electron Microprobe: specify*** WDS or EDS; acceleration voltage= xxkV; beam current = , xxxnA = , beam diameter = x μm

Number of analyses = (specify)

H2O ANALYTICAL METHOD: (***specify***)

CO2 ANALYTICAL METHOD: (***specify***)

***NOTE***: ***If H2O or CO2 was not determined directly, give the reason(s).***

***For multiple analyses please give ranges and standard deviations of the data. Please give below the analytical data that conform to the material from which the physical, optical and crystal data were obtained.***

Table 1. Chemical data (in wt %) for mineral name

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Constituent | Mean | Range | Stand. Dev. ( | Reference Material |
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|  |  |  |  |  |
| **Total** |  |  |  |  |

The empirical formula calculated on the basis of ***(specify)*** is specify

The simplified formula is specify

The ideal formula is specify, which requires constituent 1 ***(specify)*** calculated weight % 1 ***(specify),*** constituent 2 ***(specify)*** calculated weight % 2 ***(specify)***,,, constituent n ***(specify)*** calculated weight % n ***(specify)***, Total 100 wt.%.

*Notice. Empirical, simplified and ideal formula have to be consistent with each other. From the empirical formula one should derive the simplified formula and the ideal formula. Garnet example: empirical formula X(Mg2.10Fe2+0.55Ca0.35)Σ3.00  Y(Al1.70Fe3+0.20Cr0.10)Σ2.00 T(Si2.92Al0.08)Σ3.00 O12, simplified formula (Mg,Fe2+,Ca,)3(Al,Fe3+,Cr)2(Si,Al)3O12, ideal formula Mg3Al2S3O12*

CHEMICAL TESTS (etching, dissolution): ***(specify)***

# CRYSTALLOGRAPHY

Single-crystal X-ray studies were carried out with

**METHOD including information on X-ray radiation used**: Precession / Weissenberg / 4-circle / Other ***(specify***);

***NOTE: If no single-crystal study was done, explain why.***

Crystal system: (***specify***) Space group: (***specify***)

Point group: (if space group is unknown)

*a* = ( ) Å *b* = ( ) Å *c* = ( ) Å

α = ( )° β = ( )° γ = ( )°

*V* = ( ) Å3 Z =

*Follow the IUCr recommendation" Statistical descriptors in crystallography Recommendations, 12": In order to limit the round-off error of y (denoted by e) to 25% of u(y), u(y) should be quoted to two significant digits in the range 10 to 19, implying that corresponding digits also be quoted for y, and to one significant digit in the range 2 to 9.*

X-ray powder diffraction data were collected with a

Debye-Scherrer / Gandolfi / Diffractometer / Guinier / Other (***specify***)

Diameter of camera (in mm) (***specify***)

(For CuKα / FeKα or Other) (***Indicate or insert wavelength***)

Unit cell parameters refined from the powder data are as follows:

Crystal system: (***specify***) Space group: (***specify***)

Point group: (if space group is unknown)

*a* = ( ) Å *b* = ( ) Å *c* = ( ) Å

α = ( )° β = ( )° γ = ( )°

*V* = ( ) Å3 Z =

***On a separate page please supply the complete X-ray powder diffraction data as shown below. Give in bold the intensities of the seven (7) strongest lines.***

**Crystal structure:** *R* = .

(Summarize the details)

**Morphology**

Habit:

Forms:

Twinning:

The *a:b:c* (or *c:a*) ratio calculatedfrom unit-cell parameters (or morphology) is (***specify***)

**NAME**

***If named for a living person, indicate his or her acceptance and year of birth. If named for a deceased person, please give years of birth and death. For names transliterated from the Cyrillic alphabet, please give the original Cyrillic spelling.***

***Explain the reason for selecting the name.***

**TYPE MATERIAL**

***Give the name and the address of the museum where it is deposited. Only professionally curated museums are acceptable. Give the catalogue number(s) of the material. State explicitly whether holotype or cotype specimens were used.***

***Holotype: a single specimen (designated by the author) from which all the data for the original description were obtained. Where portions of such a specimen have been sent to other museums for preservation, the author will designate each of these as “part of the holotype”.***

***Cotype: specimens (designated by the author) as those used to obtain quantitative data for the original description. Specimens examined only visually should not be considered cotypes.***

**RELATION TO OTHER SPECIES**

***Include, if possible, where the species fits into a mineral classification (e.g., Nickel & Strunz, Dana).***

***If the mineral is similar to other minerals, please provide a table (on a separate page) comparing the following data for all the species involved: chemical formula, crystal system, space group, unit-cell parameters, strongest lines in the powder pattern, optical data and any other data which will help to differentiate the species from the related species.***

**COMPATIBILITY**

1-(KP/KC) = ±0.xxx (superior/ excellent/ good/ fair or poor). (***If fair or poor, give reason(s).*)**

**UNNAMED MINERAL**

No mineral close to \*\*\*\*\*\*ite is present in the lists of both valid and invalid unnamed species.

**REFERENCES** (***Please give full reference data to all pertinent material.)***

Doe, J.X., Brown, C. and Svensson, S. (2014) Structure of unknowns. *Journal of invisible* *substance*s, **44**, 2155-2161.

**AUTHORS' REMARKS**

***Add anything which will clarify difficult parts of the description.***

**CHAIRMAN’S REMARKS**

***On a separate page please supply the complete X-ray powder diffraction data as shown below. Give in bold the intensities of the seven (7) strongest lines.***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 2. X-ray powder diffraction data (*d* in Å) for ”**mineral**”. | | | | | | | | |
| *I*meas | *d*meas | *d*calc | *hkl* |  | *I*meas | *d*meas | *d*calc | *hkl* |
| xxx | xxxx | xxxx | xxxx |  | xxx | xxx | xxxx | xxxx |
|  |  |  |  |  |  |  |  |  |

## CONFIDENTIAL INFORMATION

*IMPORTANT NOTICES:*

* The following applies for the present check-list:
* Text in red letters should be retained.
* Text highlighted in green should be replaced by information/data related to the proposed new mineral or be removed.
* Tables (except *Table 1: Chemical data*) and figures with their respective table headings and figure captions should be placed at the end of the proposal (*i.e*. not in the check-list text).
* Tables (except *Tables 1 and 2: Chemical data and complete X-ray powder diffraction data*) and figures should be numbered in the order that they are called out in the check-list text.
* Please provide all data (this check-list, any additional pages, tables and figures in separate pages), in this Word format.
* Proposals presenting crystal-structure refinements have to be accompanied by a CIF (including structure factors) of the refinement and a pdf of the cif validation (checkCIF-files can be obtained at <https://checkcif.iucr.org/>)
* Recommendations pertaining to supporting structure refinement information submitted for new mineral proposals: (1) No displacement parameter (for non-H atoms) should be fixed during refinement; (2) All sites assigned more than one occupant (vacancy is considered an occupant) must be presented with refined occupation values (and standard errors).

Deviation from these recommendations require sound supporting rationale.