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# Testing monazite as a geochemical exploration tool for targeting iron oxide-copper-gold (IOCG) mineralisation

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# ABSTRACT

The aim of this project is to test the uniqueness of the chemistry of IOCG-related monazite in the Gawler Craton, South Australia. The results show that the chemistry of these monazites is relatively unique compared to the monazite formed via geological processes unrelated to mineralisation in the Gawler Craton. Furthermore, IOCG-related monazite in the Gawler Craton is quite unique even compared to the monazite from other parts of the world. This unique chemistry is defined as follows: Ce+La >63wt%, Th and/or Y < 1wt%. Apart from the chemistry uniqueness, this study also shows that igneous monazite preserves different chemistry compared to metamorphic and/or hydrothermal monazite. The assessment is undertaken by comparing IOCG-related monazite in the Gawler Craton with monazite from various geological terranes around the world (Asia, Europe, North America…) via various geological processes (metamorphic, detrital, igneous, and hydrothermal). Final outcomes of the assessment prove that the chemistry of monazite could be applied as vectoring tools in exploration for IOCG monazite out of South Australia. However, the uniqueness of these monazites is out of expectation. More data and further comparisons are required to improve the exploration criteria so that the criterion could be universally applied to target potential IOCG deposits all over the world.

**Keywords:** IOCG, monazite, exploration geochemistry

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# 1. INTRODUCTION

In the past century, demand for most mineral resources has experienced a remarkable increase, from about 26.7 billion tonnes in 1970 to about 100 billion tonnes in 2017. This demand is very likely to grow and reach 185 billion tonnes by 2050 (Gonzalez-Alvarez et al., 2020). Against this backdrop of exponentially increasing demand for metals are declining discovery rates of Tier 1 mineral deposits and declining grades of the deposits being mined (Hillis et al., 2014). The drastic growth in demand for mineral resources is mainly driven by a growing population and development and building of green technologies in the past 30 years (e.g. González-Álvarez et al., 2016).

In Australia, there is a significant challenge because most of the rocks that are considered highly prospective for hosting mineralisation are overlain by younger, barren 'cover' sediments. Historically, these cover sediments have been seen as an impediment to mineral exploration. However, obtaining comprehensive understandings of the barren sedimentary cover and then utilising these understandings to discover new deposits within the regolith cover has been the topic of several research efforts in the last 20 years (e.g. Anand et al. 2016; de Caritat et al., 2017; González-Álvarez et al., 2016; Salama et al. 2016;). As the characteristics of the cover sequences of monazite are being learnt gradually, a new consensus is obtained that geochemistry could be utilised as a helpful tool in potential deposit exploration. (e.g. Agangi et al. 2019; Brotodewo et al. 2021; Forbes et al., 2015; Tiddy et al. 2021).

In this paper, the exploration tools proposed by Forbes et al. (2015) and Tiddy et al. (2021) to undergo exploration for iron oxide-copper-gold (IOCG) deposits in the Gawler Craton, South Australia (Figure 1), based on monazite geochemistry is tested. This is done by comparing the chemistry of monazite associated with IOCG mineralisation in the Gawler Craton with the chemistry of monazite from other regions. These data are compared in the model to see their predictive performance to understand the limitations of the exploration tool proposed by Forbes et al. (2015) and Tiddy et al. (2021).

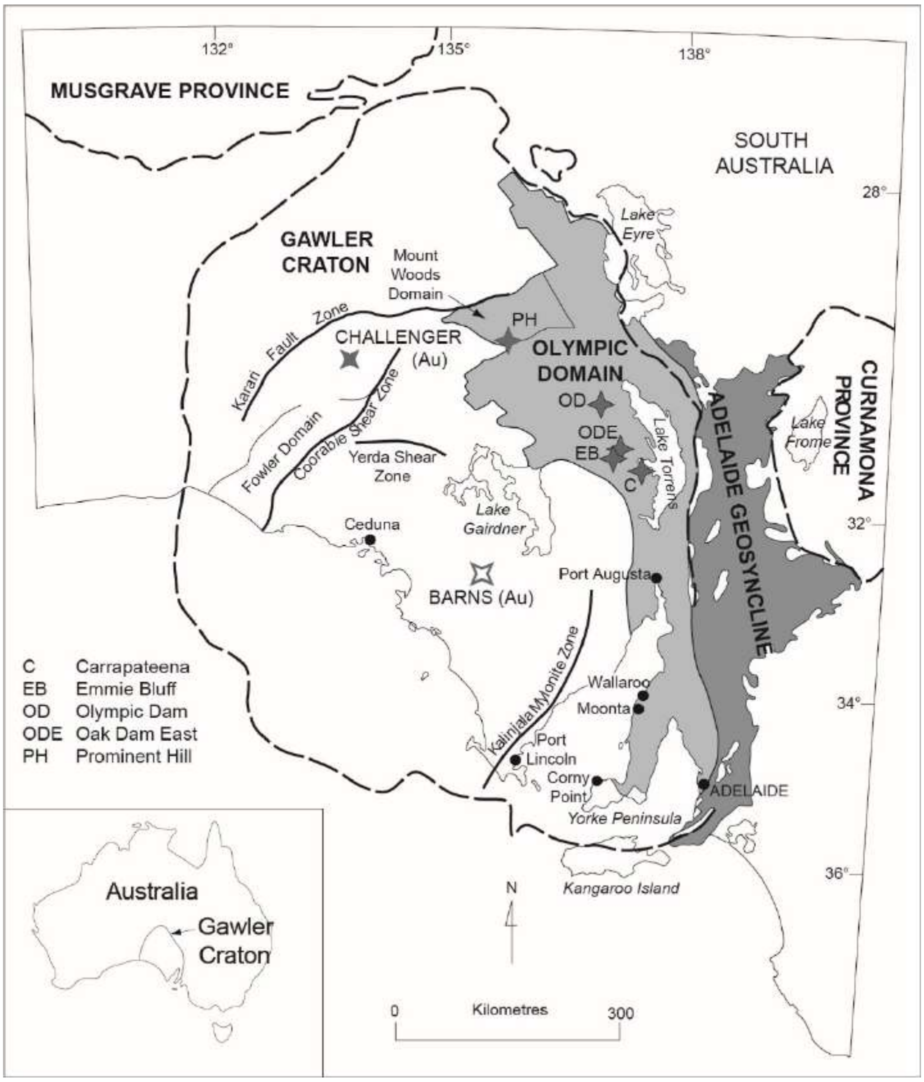


*Figure 1. Geological map of the Gawler Craton, South Australia, showing the location of IOCG deposits including the Prominent Hill and Carrapateena deposits. Figure taken from Tiddy et al. (2021).*

# 2. BACKGROUND

The challenges of having to undertake mineral exploration in buried terranes in Australia means it is difficult for Australia to maintain its inventory. Mineralisation overlain by cover sequences also may not be in ideal places for exploiting the resource (e.g. it may be too deep to extract economically). The importance of exploration techniques emerges as these techniques could largely increase the exploration efficiency and reduce the cost of exploration in buried terranes. Techniques that have been developed to overcome these challenges could be divided into three main classes: Geophysics and remote sensing; a Domain and digital approach; and Geochemistry (Gonzalez-Alvarez et al., 2020). Geophysics and remote sensing are commonly used technique in mineral exploration (e.g. Belperio et al. 2007). Generally, 3D geological simulation and predictive maps are produced in this process to target potential ore deposits. Li et al. (2019) attempted to explore Fe-Cu deposit in this way（Li et al., 2019）. Domain and digital approach is the third major approach. Goncalves and Mateus (2019) applied geochemical data, multifractal methods and singularity mapping to target the anomalies of Cu, Zn, Co concentrations in the Iberian Pyrite Belt (IPB) district(Goncalves & Mateus, 2019).

Geochemistry is the main proxy in which various element concentrations are utilised to target potential mineral deposits. Deposits are usually concentrated in altered halos, showing characteristic mineral and chemical zoning patterns (Lowell & Guilbert, 1970). This footprint is a key guide for exploration and provides a larger (up to 10 km radius) target area where mineralization may exist. However, the mineral combinations that characterize these altered zones may exist in barren hydrothermal systems or be produced by processes such as regional metamorphism. Distinguishing the mineralized environment from the barren environment, positioning the hydrothermal center in or below the altered rock belt, and identifying the edge of the ore system remains a huge challenge for the exploration industry. Geochemistry can be used because elements will move through mineralised rocks and barred cover sediments in a systematic way (Anand et al. 2016). For example, Anand et al. (2019) integrated earlier research to illustrate the relationship between Au and other pathfinder elements with physical, chemical and biological processes in the ferricrete environment. Luz et al. 2019 found that Nd Pb and Sr ratios could be used to trace the proximity of hidden sulfide ores in a Volcano Sedimentary Complex(Luz et al., 2019).

Mineral chemistry can be used for ore deposit targeting, and geochemical criteria for exploration of various deposit styles have been proposed for several minerals including zircon (Brotodewo et al. 2021; Lu et al. 2016); rutile (Agangi et al. 2019; Plavsa et al. 2018) and monazite (Forbes et al. 2015; Tiddy et al. 2021). These minerals are of particular interest as they are resistate phase minerals, which means they can withstand processes of weathering. Recent studies demonstrated that the geochemistry of rutile ($TiO_2$) could be used for mineral exploration with anomalous concentrations of Fe, W, V, Sn, and Sb (Meinhold et al., 2010; Agangi et al., 2017). Plavsa et al. (2018) found it of vital importance that a series of pathfinder elements with polymorph types(Fe, V, Sn, W, and Cr) could characterise different sorts of TiO2 polymorphs during mineral exploration. Besides, he confirms that high aluminum concentration is characteristic of brookite instead of rutile. Furthermore, Ta, Nb, Sn and W elements enriched in rutile could be used for tracking processes occurring in strongly fractionated granitic magmas such as pegmatites and associated deposits. Sb is proven to be a more Au-sensitive pathfinder element. Tin, Nb, Ta, and W are also effective pathfinder elements in mineralisation processes associated with the intrusion. The paramount finding is that rutile is a sensitive chemical tracer of different tectonothermal processes. It can help clarify the origin and nature of rutile in mineralized/barren systems when incorporated with EBSD textual characterization. In conclusion, Plavsa demonstrated that combining EBSD and petrochronological could act as a useful approach for rutile exploration (Plavsa et al., 2018).

Zircon composition could also be used for the identification of porphyry Cu ± Mo ± Au systems. Lu et al found out that Zircon composition can distinguish fertile from infertile magmatic suites. The best fertility indicators are 10,000*(Eu/Eu*)/Y (>1) and zircon Eu/Eu* (>0.3) ratios, whereas Dy/Yb (<0.3) and (Ce/Nd)/Y (>0.01) ratios are also helpful. These zircon element ratios can be used as pathfinders to magmatic suites that are potentially fertile for four porphyry systems: porphyry Cu-Mo, porphyry Mo (-W) systems, porphyry Cu-Mo-Au, and porphyry Cu-Au. With all these zircon trace element ratios, it's more likely to discriminate unprospective A-, S-, and I-type granitoids from potentially mineralizing I-type granitoids.(Lu et al., 2016)

Monazite is our main focus in this study. Forbes et al. (2015) showed that elevated light rare earth element (LREE) content in monazite can be applied as a pathfinder towards potential IOCG deposits at Prominent Hill in the Gawler Craton, South Australia (Fig. 1). Hydrothermal monazite within the mineralised zone preserves a distinctive chemical signature which is remarkably abundant in Ce and La, and depleted in Y and Th. A geochemical criterion for exploration was proposed such that contents of La + Ce > 63 wt% and Y and Th <1 wt% within monazite could be considered compelling in the search for IOCG mineralisation. Concentrations of 57.5 wt% < La+Ce < 63 wt% could be considered interesting. Concentrations of La + Ce < 57.5 wt% could be considered background (Figure 2). Forbes et al. (2015) also demonstrated that the geochemical signatures of monazite can also be recognised within whole rock geochemical data for cover sediments, which is a type of data that is commonly used by mineral exploration companies. Tiddy et al. (2021) expanded upon the work of Forbes et al. (2015) and showed that similar geochemical signatures can be recognised within monazite within the Carrapateena IOCG deposit, which is also in the Gawler Craton and located to the south of the Prominent Hill orebody (Figure 1). Tiddy et al. (2021) derived a general exploration criteria for monazite chemistry as follows:

- Compelling monazite geochemistry (i.e. associated with IOCG mineralisation): La + Ce > 63 wt% (where La > 22.5 wt% and Ce > 37 wt%), Y and/or Th < 1 wt% and Nd < 12.5 wt%.
- Interesting monazite chemistry: 45 wt% < La + Ce < 63 wt%, Y and/or Th < 1 wt%; and monazite preserving Nd > 12.5 wt% is considered to be associated with Carrapateena-style mineralisation.
- Background monazite chemistry: La + Ce < 45 wt% or Y or Th > 1 wt%.

These geochemical criteria are considered to be applicable for exploration for IOCG deposits throughout the Gawler Craton.

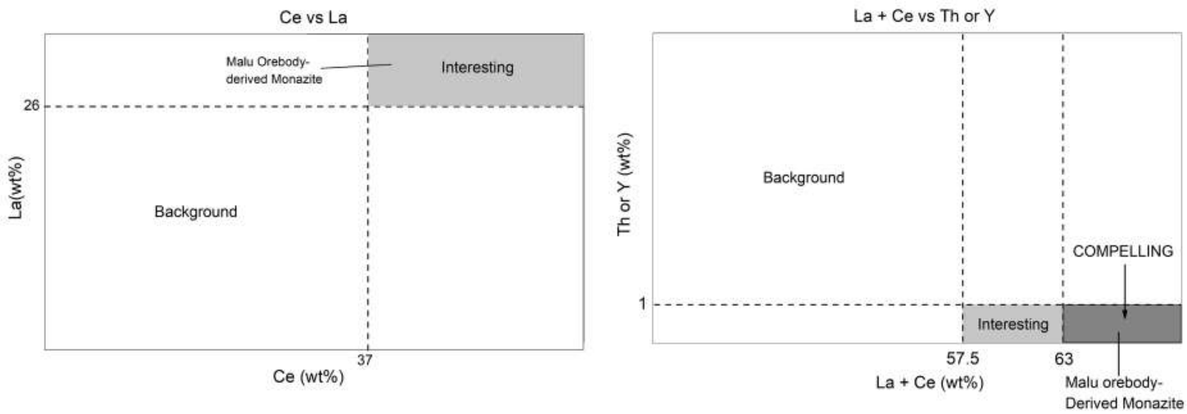


*Figure 2. Monazite geochemical exploration criteria of Forbes et al. (2015) used to discriminate monazite associated with IOCG mineralisation (compelling fields) from monazite that may be indicative of IOCG mineralization (interesting fields) and background monazite (fields labelled background). Figure taken from Forbes et al. (2015).*

# 3. METHODOLOGY

## 3.1 Data collation

In addition to monazite chemistry data taken from Forbes et al. (2015) and Tiddy et al. (2021), monazite chemistry data was collated from a series of published papers (Table 1). These papers were selected so that they represent studies from various geological terranes around the world including Asia, the Middle East, Antarctica, Europe and North America and to collect data for monazite that has formed from a range of geological processes. Geological processes include metamorphic (monazite grown due to temperature and pressure changes), hydrothermal (monazite that grew in association with fluid activity), detrital (monazite that has been reworded and incorporated into clastic sediments) and igneous (monazite that has grown in association with magmatic (igneous) activity). Chemistry data for monazite associated with various styles of mineralisation was also targeted, however it is noted that only limited amounts of this type of data were found to be available. The full dataset is given in Appendix.

*Table 1. Summary of papers from which monazite data was collated for this study.*

| Reference | Monazite type | Geographic location | Country | Deposit type |
|---|---|---|---|---|
| Forbes et al. 2015 | Hydrothermal and metamorphic | Gawler Craton, South Australia | Australia | IOCG – Prominent Hill |
| Tiddy et al. 2021 | Hydrothermal and metamorphic | Gawler Craton, South Australia | Australia | IOCG – Carapateena |
| Kostin 2000 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG |
| Dawood & El-Naby 2007 | Detrital | Northern Sinai | Egypt | Black sands |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline | South Mongolia | REE |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula | East Antarctica | |
| Zhu&O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | |
| Foster et al. 2002 | Metamorphic | Hunza Valley, Canadian Cordillera | Pakistan, Canada | |
| Copjakova et al. 2011 | Metamorphic | Drahany Upland | Czech Republic | |
| Catlos et al. 2002 | Metamorphic | | Nepel&Vietnam | |
| Cressey et al. 1999 | Igneous | Kangankunde | Malawi | |
| Foster et al. 1998 | Igneous | Erzgebirge-Fichtelgebirge region | Germany | |
| Hoshino et al. 2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | |

| | | | | |
|---|---|---|---|---|
| Nagy et al. 2001 | Metamorphic | Sopron Hills | Eastern Alps | |
| MacFarlane et al. 2009 | Metamorphic | Broken Hill | Australia | |

### 3.2 Electron microprobe analysis

The chemical compositions of monazite from all papers used in this study were all analyzed by Electron Microprobe Analysis (EMPA). There are a variety of analytical techniques that could be applied to study the chemical composition of rocks and ores like Optical Microscopy (OM), X-ray diffraction (XRD), scanning electron microscopy (SEM), Fourier Transform infrared Spectroscopy (FT-IR), and EMPA. Of all these techniques, EMPA stands out as its precise characterisation of the chemical and mineralogical composition as well as the being able to keep the textural context of the mineral being analysed. EMPA owns another remarkable advantage is that it can determine a large number of elements from boron to uranium. For all these benefits, EMPA becomes an essential analytical approach in all branches of geosciences since its advent.

Electron Microprobe provides insight into the chemical composition of minerals by focusing a narrow electron beam onto the sample to stimulate the emission of X-rays. Accelerated electrons hitting a solid target interact with the material in several ways and produce various signals (Figure 3.a), among which the most important are the backscattered electrons (BSE), the secondary electrons (SE), and the X-rays (Reed et al., 2005). The latter include the characteristic X-rays and a continuous X-ray spectrum. The scattering of the beam electrons inside the sample causes deflections and reflections in all directions. In the case of multiple deflections at a small angle or in the case of high-angle reflections, a fraction of the incident electrons exit the sample, giving rise to the backscattered electrons. The electrons backscattered originates from inside a small sample. The energy distribution of these electrons is up to the atomic number of the stimulated atom (Reed et al., 2005). The secondary electrons are ejected upon the reaction of beam electrons with atoms near the surface of the sample or emerge from the BSE when they leave the surface. The SE has a lower energy than the BSE and provides data about the surface. However, as they are partly produced by BSE, the SE also conveys some information about the chemistry.

The continuous X-ray spectrum is generated when an incident electron interacts with an atomic nucleus in the sample. It may mask the characteristic lines of elements present in low amounts. The nucleus of an atom is surrounded by electrons in several levels (called shells), labeled with increasing distance from the nucleus as K, L, M, N, O, P and Q. An electron of a compound within the sample hit by an electron from the incoming beam is expelled and leaves a vacancy. Then, an electron from an outer shell fills in this vacancy and emits characteristic X-ray radiation. If, for example, an electron fills in a vacancy left on K-shell, the according radiation is called K radiation. The energy and the wavelength of the X-ray radiation vary with the atomic number Z. The characteristic X-rays enable quantitative determination of the chemical composition of a small volume of the sample, whereas the BSE and SE are used for imaging (Figure 3.b–c).

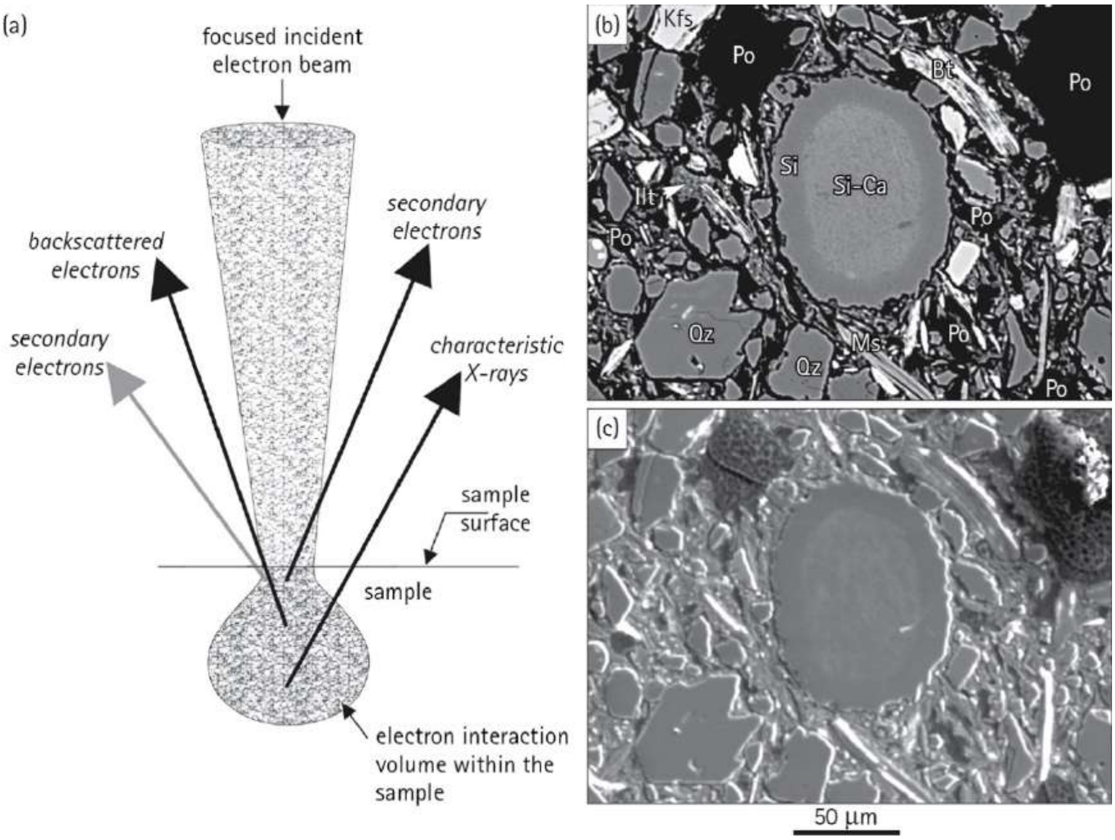


*Figure 3. (a) Origin of BSE,SE, and characteristic X-rays emitted by the interaction between the focused electron beam and sample. (b) BSE image of a ceramic sample from Ibida(Roman-Byzantine period) containing quartz(Qz), muscovite(Ms) and (chloritized) biotite(Bt) embedded in a predominantly illitic(Ilt) matrix with some pores(Po). (c) SE image of the same area as in (b), showing the high topography of the clasts and the test, and the lower topography of the illitic parts of the matrix.*

## 3.3 Testing geochemical exploration criteria

In this project, the monazite geochemical exploration criterion proposed by Forbes et al. (2015) was used to test if the chemistry of monazite from IOCG deposits in the Gawler Craton is different from the chemistry of monazite from other geological terranes around the world, by various geological processes and that may be associated with mineralisation. It is noted that the criteria of Tiddy et al. (2021) were not used as they were published immediately prior to this thesis being submitted.

Four separate steps were applied to test the criterion:

1. Published monazite data from various geological terranes and that formed by various geological processes (detrital, igneous, metamorphic and hydrothermal) was collated (Table 1). The more data, the more concise the comparisons.
2. Data was processed into a uniform format that matched the data presented in Forbes et al. (2015) (and Forbes et al. (2021)).
3. The data were plotted onto the exploration criteria presented by Forbes et al. (2015).
4. Assessment of how unique the chemistry of monazite related to IOCG mineralisation in the Gawler Craton is then made.

# 4. RESULTS

## 4.1 Monazite from the Gawler Craton

Data for the Prominent Hill and Carrapateena IOCG deposits and plotted on the geochemical exploration diagrams of Forbes et al. (2015) is shown in Figure 4. These plots highlight how unique the chemistry of monazite from Prominent Hill and Carrapateena is.

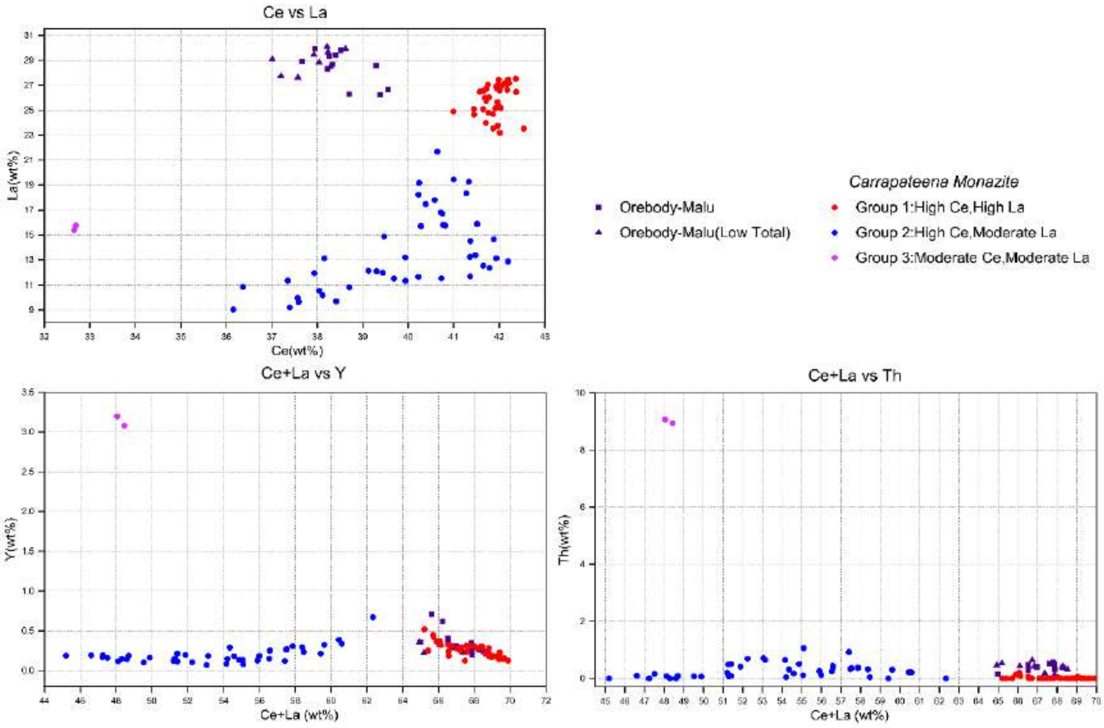


*Figure 4. Data for monazite chemistry from the Prominent Hill and Carrapateena areas in the Gawler Craton plotted on the geochemical exploration criteria of Forbes et al. (2015). Data taken from Forbes et al. (2015) and Tiddy et al. (2021).*

Data for monazite in the Gawler Craton that is not associated with IOCG mineralisation is shown in Figure 5. These monazite grains are metamorphic in origin, or are associated with major shear zones within the Gawler Craton.

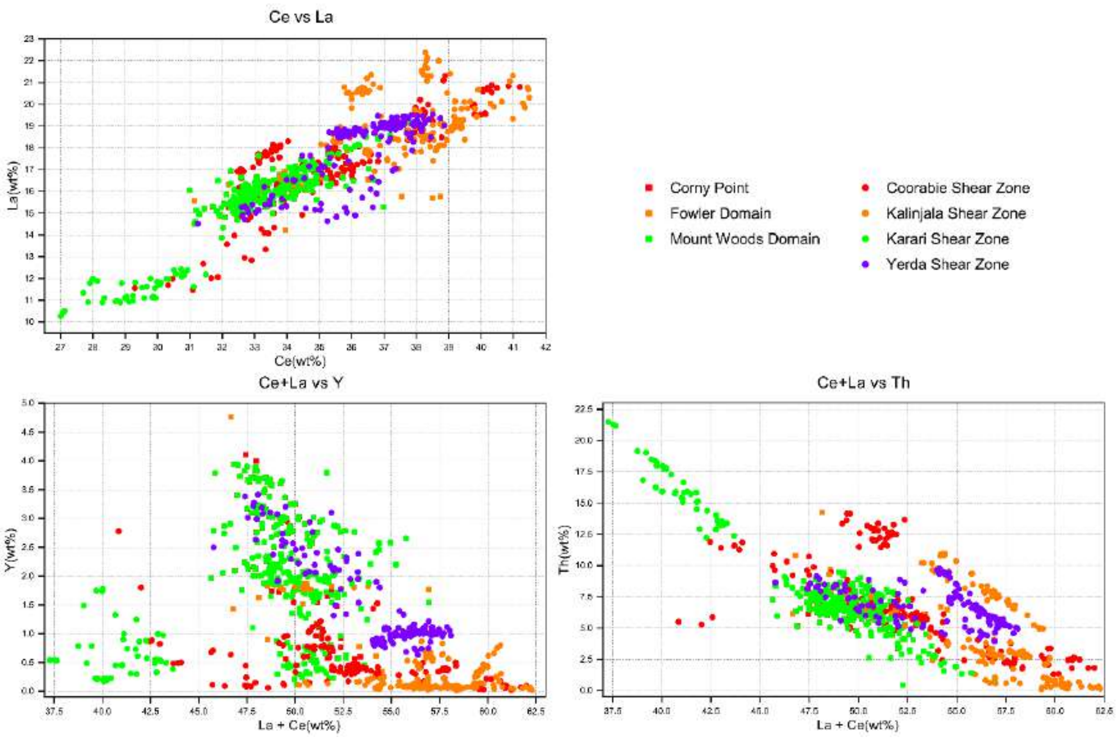


*Figure 5. Data for monazite chemistry from the Gawler Craton that is not associated with IOCG mineralisation. Data is plotted on the geochemical exploration criteria of Forbes et al. (2015). Data taken from Forbes et al. (2015).*

## 4.2 Monazite from outside the Gawler Craton

Data for monazite from outside the Gawler Craton is shown in Figure 6. The data is separated into four general categories according to the origin of the monazite: detrital (n=14), igneous (n=60), metamorphic (n=665) and hydrothermal (n=7). Hydrothermal monazite is then separated again according to the style of mineralisation the monazite is associated with.

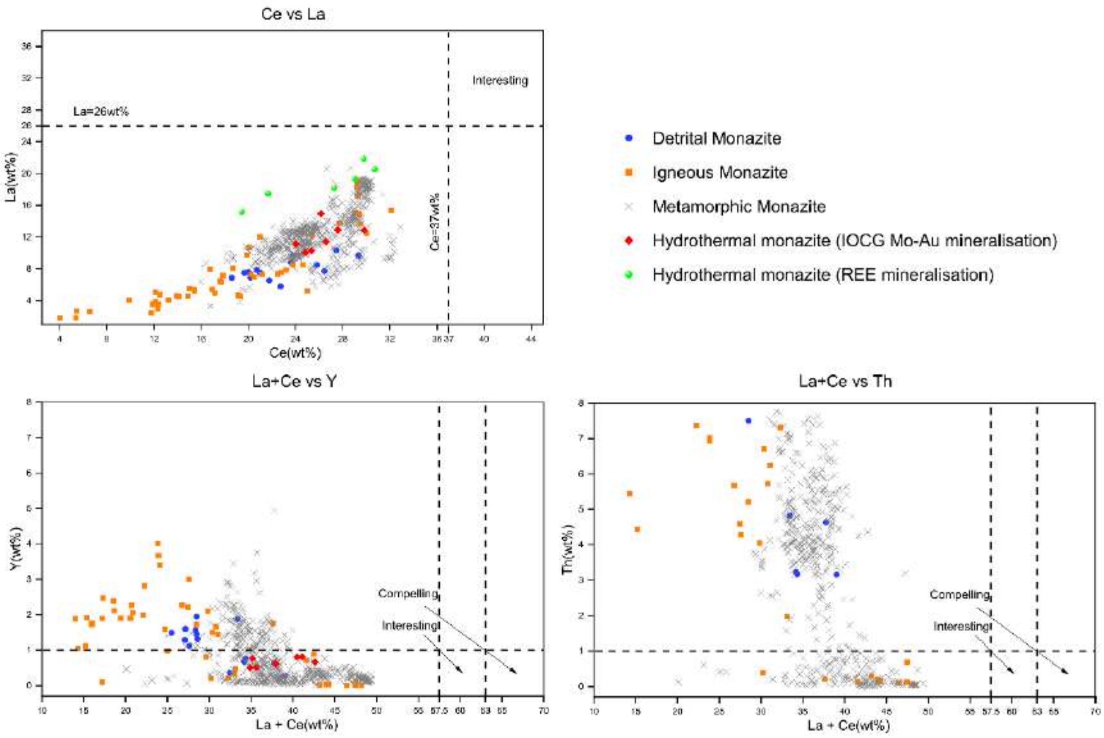


*Figure 6. Geochemical data for monazite from outside the Gawler Craton. Data is coloured according to the origin of the monazite. Data sources are given in Table 1. Geochemical plots are taken from Forbes et al. (2015).*

Figure 6 shows that data for monazite from outside the Gawler Craton has a relatively stable concentration of Ce + La compared to IOCG-related monazite data from the Gawler Craton. For the Ce and La concentration, all the monazite data have a Ce concentration ranging from 14 wt% to ~ 34 wt%, while La concentration range from ~ 4 wt% to ~22 wt%. They also preserve La+Ce content from ~15 wt% to ~50 wt%. Most of the monazite grains preserve Y content from 0 to ~4 wt%. This phenomenon is slightly different for Th. The Th content of monazite disperses more broadly than Y, and ranges from 0 to ~8 wt%. One important thing is that no data falls into the 'interesting' or 'compelling' fields of the geochemical exploration criteria.

# 5. DISCUSSION

## 5.1 Comparisons of world data to IOCG-related monazite from the Gawler Craton

A proportion of the monazite groups (Group 1-5) preserve geochemistry that is different from the IOCG-related monazite from the Gawler Craton, South Australia and according to the exploration criteria proposed by Forbes et al. (2015).

The monazite data from outside the Gawler Craton (the world monazite data) has little similarity with all the data from the Prominent Hill ore deposits and the Carrapateena deposits. (Forbes et al., 2015; Tiddy et al., 2019)

However, for comparison the monazite data from outside the Gawler Craton does have some similarity with the Group 2 monazite data(High Ce, Moderate La) from the Carrapateena ore deposits according to figure 6 of Tiddy et al. (2021) A possible explanation for the phenomenon is that monazite from different origins preserves different LREE contents. Carrapateena monazite has higher Nd concentrations. But the Nd concentration of world data hasn't been fully investigated due to the Nd data limitation. Apart from this, world monazite data also overlaps with the Group 3 data(Moderate Ce, Moderate La) from the Carrapateena deposits. However, as there are just only two dots for this group, it couldn't indicate much.

Overall, the important outcome from this comparison is that the chemistry of monazite related to IOCG systems in the Gawler Craton is very different from the chemistry of monazite from other parts of the world that are of various origins. This indicates that the chemistry of monazite related to IOCG systems in the Gawler Craton is very unique and highlights the potential for this criteria to be used in other parts of the world to explore IOCG systems. However, there is a limitation to this conclusion as no published geochemical data for monazite that is related to an IOCG system outside the Gawler Craton was found to compare with the Gawler Craton IOCG-related monazite data.

## 5.2 Hydrothermal monazite

If we concentrate more on the hydrothermal monazite which is directly associated with mineralisation, we could hardly find much difference with other monazites.

Hydrothermal monazite is the monazite that grows due to the activities of fluids. The reason that hydrothermal monazite receives most of the attention is that hydrothermal activity is associated with mineralisation directly. The generation of a variety of ore deposits is proved to be associated with hydrothermal activities. (e.g. Groves et al. 2010; Oreskes & Einaudi 1992 ) As our focus is on IOCG deposits, we undertake a list of comparisons here. The finding that a huge proportion of hydrothermal monazite from Carrapateena deposits and Prominent Hill in the Gawler Craton preserves relative unique geochemistry to other monazite(metamorphic, igneous and detrital) in the Gawler Cration. (Forbes et al. 2015; Tiddy et al. 2021) Besides, the comparisons of the hydrothermal monazite in South Australia to monazite from around the world also confirm the point that IOCG-related hydrothermal monazite preserves quite unique chemistry. This result could even be extended to monazite related to the formation of Mo-Au ores in the Kis-Kuel IOCG deposit, East Yakutia, Russia(Kostin, 2020). All these together indicate that the chemistry of hydrothermal monazite in the Gawler Craton may be quite unique, even between IOCG deposits. The cause for this difference could be of various reasons. One cause might be ascribed to the different hydrothermal fluids related to mineralisation. However, given the fact that there are hardly enough data for this comparison, we couldn’t say exactly what caused the monazite chemistry differences.

Apart from the comparisons between IOCG-related monazite, hydrothermal monazite associated with REE mineralisation in Mongolia is also added. The result for this comparison is similar that the chemistry of monazite in the Gawler Craton is different. The REE-related monazite has a higher La content than the IOCG-related monazite from Kis-Kuel deposit. Again, the data limitation is the major challenge for the establishment of a solid conclusion.

## 5.3 Metamorphic monazite

Comparison of monazite geochemical data from Corny point, Fowler Domain and the Mount Woods Domain in the Gawler Craton with metamorphic monazite data from around the world shows they have similar chemistry (Figure 5). Almost all data for metamorphic monazite from the Gawler Craton fall into the background section and in a limited geochemical range. All the data for metamorphic monazite from elsewhere in the world plot within the background fields on all the geochemical criteria plots (Figure 6).

Overall, there are no geochemical characteristics that could be used to put together a criteria that would distinguish metamorphic monazite from other types of monazite.

## 5.4. Igneous monazite

From Figure 6, it could be obtained that all the igneous data fall into the background field. However, this might be an interesting phenomenon. Igneous data are scattered. One group of data preserves significantly different Ce and La concentrations compared to other monazite in the criteria which is very interesting. This result is strengthened again in the La+Ce vs Y figure and La+Ce vs Th figure. Despite the gap of La and Ce, the concentration of Y and Th presents little differences with comparisons to other types of monazites.

Given that the chemistry of igneous monazite is relatively unique, we have done some work to explore the reason. From the original dataset shown in the  Appendix, we find that this special group of igneous monazite mainly comes from various origins which include Tanzawa, Kanagawa, Nakano Shimane in Japan, and Erzgebirge-Fichtelgebirge region in Germany. (Foseter et al., 1998; Hoshino et al., 2012)

However, it still remains unclear why this phenomenon occurs, why the La and Ce content in many igneous monazites are lower than other types of monazite. As igneous monazite is the monazite that grows due to igneous activities, the uniqueness in igneous monazite chemistry might be owing to the magma activities in different locations. Geological terranes are associated with magma activities that resulted in low Ce and La contents. So, one possible reason is the geological process difference.

To conclude, the comparison demonstrates that a large amount of igneous monazite owns different chemistry from other monazites. The cause remains unclear. One possible reason is the difference in geological processes and locations. However, data availability is the main limitation here. Further research requires more comparisons between different types of monazites to confirm the former hypothesis.

### 5.5 Detrital monazite

According to Figure 6. All detrital monazite plots fall into the 'background' section. And the detrital plots overlap with other monazites, mainly metamorphic and igneous monazite which makes sense to some extent. This is because detrital monazites are the monazite grains that are part of clastic sedimentary rocks. And clastic sedimentary rocks are made of minerals and/or rocks that have been weathered, eroded, transported, and redeposited as sediments. Therefore, the detrital monazite could be originated from other types of monazite and thus preserves similar chemistry.

# 6. CONCLUSIONS

IOCG-related hydrothermal monazite in the Gawler Craton has a chemistry that is unique relative to the chemistry of monazite from around the world. This conclusion is drawn from comparison of the chemistry of the IOCG-related hydrothermal monazite in the Gawler Craton with metamorphic and igneous monazite from various geological terranes around the world, as well as hydrothermal monazite from Mo-Au ores associated with IOCG mineralisation in Russia and REE mineralisation in Mongolia. These conclusions show that the geochemical criteria developed by Forbes et al. (2015) and refined by Tiddy et al. (2021) may be used to confidently explore IOCG deposits within the Gawler Craton, and possibly around the world. Furthermore, this study also showed that there is potential to distinguish igneous monazite from chemistry alone. Further investigation including collation and/or collection of additional monazite data from IOCG systems around the world or that is of igneous origin is required to support these conclusions before they can be considered robust.

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# APPENDIX

| Reference | Monazite type | Geographic location | Country | Deposit type | Ore association | Analytical technique | La (wt%) | Ce (wt%) | Y (wt%) | Th (wt%) |
|---|---|---|---|---|---|---|---|---|---|---|
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG | Mo-Au ores | Electron microprobe | 10.2662672 | 25.3655067 | 0.511836 | |
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG | Mo-Au ores | Electron microprobe | 10.0445704 | 24.8276316 | 0.5039616 | |
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG | Mo-Au ores | Electron microprobe | 11.1445276 | 24.0165501 | 0.7638168 | |
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG | Mo-Au ores | Electron microprobe | 12.8584144 | 29.8136484 | 0.6614496 | |
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG | Mo-Au ores | Electron microprobe | 14.9474804 | 26.1595128 | 0.8110632 | |
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, | Russia | IOCG | Mo-Au ores | Electron microprobe | 11.4088584 | 26.5693224 | 0.6220776 | |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | East Yakutia | | | | | | | | |
| Kostin 2020 | Hydrothermal | Kis-Kuel IOCG deposit, East Yakutia | Russia | IOCG | Mo-Au ores | Electron microprobe | 12.9095752 | 27.5938464 | 0.8031888 | |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 8.5012196 | 25.8009294 | 0.7638168 | 3.18128858 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 7.4865304 | 19.6537854 | 1.6063776 | 12.20665701 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 9.6864448 | 29.3440749 | 0.2677296 | 3.1637124 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 6.864074 | 18.5951106 | 1.496136 | 16.23160223 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 6.565636 | 21.771135 | 1.5591312 | 8.29595696 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 7.6144324 | 19.9696803 | 1.1181648 | 11.38057655 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 10.3344816 | 27.4487055 | 0.629952 | 4.63132343 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 6.9152348 | 20.1660474 | 1.2835272 | 13.45456579 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 5.7811704 | 22.7273574 | 1.456764 | 7.50502886 |

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| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 7.503584 | 20.9856666 | 1.9449768 | 11.74088824 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 7.7423344 | 26.4412569 | 0.6771984 | 3.24280521 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 7.8787632 | 20.7124602 | 1.3150248 | 10.73025789 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 9.6693912 | 23.7689568 | 1.8819816 | 4.82466141 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 8.8167112 | 23.6238159 | 0.3700968 | 11.17845048 |
| Dawood & El-Naby 2007 | Detrital | northern Sinai | Egypt | black sands | | Electron microprobe | 0.2387504 | 0.8708454 | 0.8740584 | 65.54157522 |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic-Plutonic Complex | South Mongolia | REE | | Electron microprobe | 18.1706108 | 27.2950269 | | |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic-Plutonic Complex | South Mongolia | REE | | Electron microprobe | 15.1521236 | 19.4488806 | | |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic- | South Mongolia | REE | | Electron microprobe | 17.47994 | 21.6174564 | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Plutonic Complex | | | | | | | | |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic-Plutonic Complex | South Mongolia | REE | | Electron microprobe | 17.437306 | 21.7028334 | | |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic-Plutonic Complex | South Mongolia | REE | | Electron microprobe | 21.828608 | 29.7880353 | | |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic-Plutonic Complex | South Mongolia | REE | | Electron microprobe | 20.506954 | 30.7101069 | | |
| Enkhbayar et al. 2016 | Hydrothermal | Mushgai Khudag Alkaline Volcanic-Plutonic Complex | South Mongolia | REE | | Electron microprobe | 19.355836 | 29.0025669 | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 11.6220284 | 21.2417976 | 3.4332384 | 4.82466141 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 12.3382796 | 23.0091015 | 3.1812576 | 0.540467535 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5002888 | 23.1969309 | 3.7560888 | 594.953693 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5258692 | 23.5213635 | 2.6221752 | 0.463132343 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.5064512 | 25.5021099 | 1.4252664 | 0.767200257 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.6940408 | 25.0239987 | 1.259904 | 0.775109538 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 14.111854 | 25.9972965 | 0.2677296 | 3.44493128 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.0398416 | 24.0677763 | 1.5276336 | 4.71041624 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.1592168 | 24.1787664 | 1.535508 | 4.6576877 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5685032 | 25.2203658 | 0.1811112 | 11.97816667 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.9095752 | 25.4850345 | 0.5354592 | 5.89680839 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6537712 | 22.9322622 | 1.1575368 | 7.19744571 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8072536 | 22.8127344 | 1.0945416 | 7.56654549 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.4320744 | 24.2812188 | 1.4646384 | 4.69284006 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 11.3662244 | 23.820183 | 0.275604 | 7.43472414 |

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| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 11.4941264 | 24.6568776 | 0.3228504 | 7.39957178 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 10.9313576 | 24.6398022 | 0.6142032 | 4.49071399 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0204236 | 24.7166415 | 0.8110632 | 4.86860186 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.57703 | 23.4615996 | 1.2520296 | 6.10772255 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.108056 | 24.332445 | 1.7481168 | 3.15492431 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5599764 | 24.4007466 | 1.7953632 | 2.48702947 |

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| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5429228 | 24.332445 | 1.8662328 | 2.68915554 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5855568 | 24.4007466 | 1.9922232 | 2.46945329 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6281908 | 24.8276316 | 0.1732368 | 6.77561739 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6367176 | 25.1606019 | 0.2519808 | 6.58227941 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.4747084 | 24.9471594 | 1.8268608 | 2.80340071 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.3809136 | 24.7678677 | 1.7874888 | 2.82976498 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 12.9266288 | 24.6312645 | 0.5590824 | 5.8880203 |

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| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8925216 | 25.3825821 | 0.118116 | 6.44166997 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.7390392 | 25.2459789 | 0.2598552 | 6.75804121 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.9010484 | 25.8265425 | 0.2519808 | 5.4486158 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.00337 | 24.9215463 | 0.2992272 | 6.36257716 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8584144 | 24.161691 | 0.669324 | 6.00226547 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0545308 | 23.820183 | 1.3622712 | 5.26406591 |

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| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.57703 | 24.247068 | 0.8425608 | 5.55407288 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8243072 | 24.503199 | 1.5827544 | 2.53096992 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5429228 | 23.7262683 | 1.37802 | 4.49950208 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6793516 | 24.7081038 | 0.551208 | 5.5364967 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.5320316 | 24.9130086 | 1.0157976 | 3.91070005 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.046004 | 24.3495204 | 1.6693728 | 2.74188408 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 12.7816732 | 24.7849431 | 0.9291792 | 4.69284006 |

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| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5685032 | 23.8628715 | 1.259904 | 4.11282612 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5855568 | 24.7764054 | 1.5512568 | 3.12856004 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5429228 | 25.4081952 | 1.5118848 | 2.29369149 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 11.894886 | 23.7518814 | 2.9529 | 1.94216789 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0289504 | 25.7923917 | 0.1417392 | 5.96711311 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0374772 | 25.4167329 | 0.157488 | 5.43982771 |

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| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5088156 | 25.2459789 | 1.732368 | 3.2515933 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0801112 | 25.9460703 | 0.8425608 | 3.36583847 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.5064512 | 24.6312645 | 0.6614496 | 3.50644791 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.3103348 | 24.0250878 | 0.314976 | 4.93890658 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.1653792 | 24.8020185 | 0.1811112 | 5.43982771 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.4126564 | 24.9983856 | 0.2204832 | 4.47313781 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 13.5320316 | 25.1349888 | 0.1417392 | 4.72799242 |

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| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.42971 | 25.8948441 | 0.314976 | 4.47313781 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.3273884 | 24.75933 | 0.3858456 | 4.32374028 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0204236 | 24.8276316 | 1.2047832 | 3.73493825 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.4638172 | 24.9556971 | 0.2519808 | 4.57859489 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.2932812 | 25.186215 | 0.19686 | 4.62253534 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.1483256 | 25.2032904 | 0.354348 | 4.78072096 |

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| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.4808708 | 25.3996575 | 0.118116 | 5.06193984 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.344442 | 24.6910284 | 0.19686 | 4.62253534 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.5917192 | 25.6899393 | 0.236232 | 4.43798545 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.3785492 | 25.0496118 | 0.3779712 | 4.52586635 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.704932 | 23.0688654 | 1.1575368 | 5.66831805 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.600246 | 24.4775859 | 1.259904 | 1.08093507 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 12.9522092 | 24.4348974 | 1.0551696 | 4.07767376 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.747566 | 24.8105562 | 0.4409664 | 5.60680142 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.875468 | 24.5800383 | 0.2992272 | 5.43982771 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.9351556 | 25.0666872 | 0.1496136 | 6.43288188 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8498876 | 24.4946613 | 0.2677296 | 5.90559648 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8498876 | 24.4605105 | 0.3071016 | 6.11651064 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.704932 | 23.7689568 | 0.4803384 | 5.89680839 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.918102 | 24.0592386 | 0.826812 | 5.22012546 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6537712 | 23.90556 | 0.8425608 | 6.11651064 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6452444 | 24.3836712 | 0.669324 | 6.46803424 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.321226 | 23.3762226 | 0.5827056 | 7.17986953 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0545308 | 24.6227268 | 0.2598552 | 5.58922524 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.1227452 | 25.8094671 | 0.2126088 | 5.43103962 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 13.1227452 | 25.5618738 | 0.1653624 | 6.3274248 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.2762276 | 26.2448898 | 1.0079232 | 3.26916948 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.0801112 | 25.783854 | 0.118116 | 6.37136525 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.7560928 | 23.564052 | 1.417392 | 5.38709917 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.7134588 | 23.4615996 | 1.8347352 | 5.01799939 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6964052 | 24.1104648 | 1.4803872 | 4.93011849 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.4382368 | 25.6643262 | 0.2913528 | 5.03557557 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.1483256 | 26.0570604 | 0.2283576 | 5.0092113 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.1056916 | 22.966413 | 1.2914016 | 5.54528479 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.9777896 | 25.4252706 | 0.433092 | 5.00042321 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8584144 | 25.3398936 | 0.6614496 | 5.22012546 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.8584144 | 25.698477 | 0.4960872 | 5.02678748 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.5940836 | 23.564052 | 0.275604 | 5.98468929 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer | East Antarctica | | | Electron microprobe | 14.0095324 | 24.8276316 | 0.6771984 | 3.88433578 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Islands, Prydz Bay | | | | | | | | |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.4126564 | 25.7240901 | 0.1417392 | 5.52770861 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 14.2909168 | 25.5960246 | 0.5433336 | 2.4606652 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.9327912 | 26.6546994 | 0.6771984 | 1.73125373 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.685514 | 25.6387131 | 1.102416 | 0.427101174 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 13.3273884 | 22.0784922 | 0.5590824 | 8.72657337 |
| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 12.6878784 | 23.3762226 | 1.4410152 | 5.22012546 |

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| Hokada et al. 2016 | Metamorphic | Mather Peninsula, Rauer Islands, Prydz Bay | East Antarctica | | | Electron microprobe | 14.8622124 | 27.5340825 | 0.4094688 | 1.36215395 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 12.2103776 | 26.3046537 | 0.0472464 | 4.85981377 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 12.5258692 | 26.8254534 | 0.0551208 | 5.58922524 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 12.7305124 | 26.7400764 | 0.039372 | 5.22891355 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 11.3235904 | 25.4594214 | 0.078744 | 7.63685021 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 12.918102 | 27.3377154 | 0.0629952 | 5.43103962 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 10.6670268 | 24.6056514 | 0.0551208 | 10.05357496 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 13.4808708 | 26.3900307 | 0.0629952 | 4.99163512 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 10.8631432 | 23.2737702 | 0.078744 | 10.43146283 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 14.0777468 | 26.7998403 | 0.0551208 | 4.79829714 |

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| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 11.6561356 | 24.0592386 | 0.0551208 | 6.87228638 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 10.4538568 | 22.0358037 | 0.0629952 | 12.44393544 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 12.6281908 | 27.576771 | 0.0472464 | 5.63316569 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 11.3918048 | 26.1936636 | 0.0314976 | 9.53507765 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 13.7452016 | 27.8670528 | 0.1102416 | 4.24464747 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 11.9289932 | 26.9022927 | 0.0472464 | 6.87228638 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 11.0933668 | 26.0229096 | 0.0629952 | 9.94811788 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 13.557612 | 27.3462531 | 0.0314976 | 2.44308902 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 12.065422 | 25.2545166 | #VALUE! | 8.6123282 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 9.4306408 | 21.5833056 | #VALUE! | 14.50913659 |
| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 8.8593452 | 22.3858494 | #VALUE! | 13.13819455 |

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| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 11.3747 512 | 24.6141 891 | #VALU E! | 8.1377 7134 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 11.6902 428 | 26.1680 505 | #VALU E! | 3.3306 8611 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 8.29657 64 | 20.2684 998 | 0.06299 52 | 16.310 69504 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 12.3809 136 | 26.0570 604 | #VALU E! | 3.5503 8836 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 8.94461 32 | 20.6270 832 | #VALU E! | 15.959 17144 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 10.1042 58 | 21.0198 174 | #VALU E! | 14.456 40805 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 6.37804 64 | 15.9825 744 | 0.04724 64 | 24.641 80436 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 11.1274 74 | 25.6045 623 | 0.04724 64 | 3.3922 0274 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 11.9631 004 | 27.3718 662 | 0.05512 08 | 0.9754 7799 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 8.65470 2 | 21.8821 251 | #VALU E! | 11.4245 17 |
| Zhu & O'Nions 1999 | Metamorp hic | Lewisian terrain | Scotlan d | | | Electron microprobe | 9.92519 52 | 21.9931 152 | #VALU E! | 10.686 31744 |

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| Zhu & O'Nions 1999 | Metamorphic | Lewisian terrain | Scotland | | | Electron microprobe | 7.6144324 | 19.7050116 | 0.0629952 | 12.36484263 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.6097036 | 24.076314 | 0.8346864 | 4.52586635 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.6438108 | 24.1275402 | 0.8583096 | 4.71041624 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.763186 | 23.9994747 | 1.5197592 | 4.0425214 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.6182304 | 24.0421632 | 1.4646384 | 4.07767376 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.081042 | 23.1542424 | 1.5118848 | 5.31679445 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.0895688 | 23.0347146 | 1.4331408 | 5.68589423 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.4903284 | 24.2641434 | 1.0866672 | 4.36768073 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.4135872 | 23.7177306 | 1.5276336 | 4.33252837 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.9848828 | 24.6312645 | 1.692996 | 3.88433578 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.848454 | 24.2726811 | 1.417392 | 4.15676657 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.336846 | 24.0336255 | 1.3307736 | 4.07767376 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.4391676 | 24.2385303 | 1.102416 | 4.06888567 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.5841232 | 24.2043795 | 1.7008704 | 3.4273551 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.5414892 | 24.1019271 | 1.6614984 | 3.52402409 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.1577832 | 22.8895737 | 1.1654112 | 4.16555466 |

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| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.550016 | 23.5896651 | 1.8268608 | 3.92827623 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 8.5864876 | 21.5662302 | 1.7638656 | 3.55038836 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.5329624 | 23.6238159 | 2.126088 | 3.96342859 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.4732748 | 23.3676849 | 2.1497112 | 3.88433578 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.763186 | 24.4690482 | 0.6850728 | 4.77193287 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.507382 | 23.9140977 | 0.826812 | 5.23770164 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.976356 | 24.1190025 | 1.811112 | 3.49765982 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.464748 | 23.8714092 | 1.3858944 | 4.31495219 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.422114 | 23.6408913 | 1.4331408 | 4.69284006 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.4818016 | 23.7860322 | 1.141788 | 3.7788787 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.550016 | 23.7177306 | 1.0000488 | 4.69284006 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.507382 | 23.5384389 | 2.2520784 | 3.76130252 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.4306408 | 23.3676849 | 2.2363296 | 4.01615713 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.3283192 | 23.307921 | 2.3308224 | 3.99858095 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 8.7143896 | 21.6942957 | 2.1733344 | 3.8667596 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 10.23898144 | 24.08570547 | 1.6496868 | 4.42040927 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 10.39331652 | 25.05558819 | 1.55046936 | 3.572358585 |

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| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.77086012 | 24.8617824 | 0.58113072 | 4.794781904 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.38630144 | 24.26072832 | 0.7913772 | 4.959119187 |
| Foster2002 | Metamorphic | Hunza Valley | Pakistan | | | Electron microprobe | 9.26948428 | 23.8884846 | 0.76145448 | 5.830897715 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.4941264 | 25.2118281 | 0.1259904 | 3.40977892 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.4003316 | 24.9556971 | 0.1338648 | 4.10403803 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.042206 | 24.6398022 | 0.8976816 | 3.64705735 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.9825184 | 24.2897565 | 1.102416 | 3.30432184 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.0933668 | 24.4519728 | 1.1102904 | 3.62948117 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.9739916 | 24.1275402 | 1.0787928 | 3.59432881 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.4538568 | 23.3164587 | 1.7008704 | 3.26916948 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7693484 | 23.8970223 | 1.0394208 | 3.81403106 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.8972504 | 24.0677763 | 0.9921744 | 3.43614319 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.3235904 | 24.9044709 | 0.2677296 | 3.84918342 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.425912 | 25.2801297 | 0.0944928 | 3.2515933 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.4514924 | 25.0923003 | 0.1732368 | 3.87554769 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7693484 | 24.1104648 | 1.0079232 | 3.66463353 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.5561784 | 23.3591472 | 1.9371024 | 3.14613622 |

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| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.4855996 | 25.0923003 | 0.1417392 | 3.515236 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.1871616 | 24.6654153 | 0.19686 | 3.99858095 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.5282336 | 25.100838 | 0.0236232 | 4.05130949 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.9910452 | 24.3836712 | 0.9213048 | 3.7788787 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.44533 | 23.4615996 | 1.7559912 | 3.43614319 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.3576976 | 25.1349888 | 0.2677296 | 3.46250746 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.6561356 | 25.1947527 | 0.19686 | 3.11098386 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.3065368 | 24.7422546 | 0.4409664 | 3.3394742 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.5647052 | 23.3335341 | 1.3701456 | 4.09524994 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.3491708 | 24.9727725 | 0.3385992 | 3.15492431 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.18847968 | 22.62405123 | 1.38825672 | 4.689324824 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.84504328 | 24.42123708 | 1.2362808 | 4.796539522 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.54404724 | 24.1019271 | 1.37880744 | 5.059303413 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.6224938 | 24.18303525 | 1.2874644 | 5.307127551 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.6011768 | 24.45453411 | 1.0157976 | 4.943300625 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.422114 | 23.7177306 | 1.811112 | 4.63132343 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.635284 | 24.2299926 | 1.1181648 | 5.02678748 |

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| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.3538996 | 23.9823993 | 1.1181648 | 5.13224456 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.507382 | 24.5202744 | 1.4803872 | 4.27101174 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.763186 | 24.8276316 | 1.4410152 | 3.98979286 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.16631 | 23.7689568 | 1.4016432 | 4.89496613 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.208944 | 23.8031076 | 1.3543968 | 5.00042321 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.976356 | 24.6568776 | 1.6772472 | 3.57675263 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.9848828 | 24.844707 | 1.5433824 | 3.79645488 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.0275168 | 24.9130086 | 1.338648 | 3.94585241 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.6693912 | 23.8970223 | 1.6221264 | 4.60495916 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.7034984 | 24.2812188 | 1.8426096 | 4.51707826 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.0786776 | 24.8020185 | 1.0709184 | 4.16555466 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.8119824 | 26.0314473 | 1.2362808 | 2.05641306 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.6073392 | 25.6045623 | 0.3779712 | 3.81403106 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.3344816 | 24.9044709 | 0.9764256 | 4.19191893 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.0786776 | 24.503199 | 1.5433824 | 4.32374028 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.0895688 | 22.0358037 | 0.3622224 | 10.85329115 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.59265 | 22.9920261 | 0.3071016 | 10.74783407 |

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| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.1127848 | 23.9482485 | 0.3622224 | 8.95506371 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.0872044 | 24.6995661 | 1.5118848 | 3.94585241 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.6499732 | 27.1840368 | 0.708696 | 1.87186317 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.6585 | 27.2694138 | 0.5433336 | 2.20581059 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.3685888 | 25.3825821 | 0.3307248 | 5.0092113 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.7717128 | 23.8457961 | 1.732368 | 4.08646185 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 9.8569808 | 24.4605105 | 1.8347352 | 3.97221668 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.0677864 | 25.3740444 | 0.3307248 | 4.55223062 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7693484 | 25.1435265 | 0.2992272 | 3.70857398 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.1018936 | 25.8777687 | 0.2834784 | 3.6909978 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.6670268 | 24.7422546 | 0.4409664 | 5.22012546 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7181876 | 24.6227268 | 0.4567152 | 5.26406591 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7778752 | 25.4764968 | 0.5197104 | 3.54160027 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.8887236 | 24.9983856 | 0.3858456 | 4.3061641 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 11.2042152 | 24.8788578 | 0.3228504 | 4.09524994 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.8460896 | 24.4348974 | 0.354348 | 5.87044412 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.8972504 | 25.2289035 | 0.5275848 | 3.85797151 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7096608 | 24.9642348 | 0.6457008 | 4.2182832 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.7778752 | 24.9386217 | 0.6535752 | 4.22707129 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.4794372 | 24.6483399 | 0.8583096 | 4.01615713 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.360062 | 24.2556057 | 0.8504352 | 4.0425214 |
| Foster2002 | Metamorphic | Canadian Cordillera | Canada | | | Electron microprobe | 10.9739916 | 24.9898479 | 0.5748312 | 4.49071399 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 10.7096608 | 23.3420718 | 2.0709672 | 3.92827623 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 3.325452 | 16.7680428 | 0.4645896 | 0.11424517 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 7.5121108 | 25.3740444 | 0.4567152 | 0.29000697 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 14.7002032 | 28.4732295 | 0.2441064 | 0.07909281 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 10.2918476 | 24.1360779 | 0.7008216 | 0.54486158 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 14.0436396 | 27.8499774 | 0.5275848 | 0.93153754 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 11.72435 | 26.4241815 | 0.4645896 | 1.59064429 |
| Copjakova 2011 | Metamorphic | Drahany Upland | Czech Republic | | | Electron microprobe | 17.096234 | 30.1210056 | 0.0551208 | 3.19886476 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.441532 | 21.002742 | 1.0157976 | 3.64705735 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.10046 | 21.941889 | 0.8110632 | 3.3394742 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.95314 | 21.088119 | 1.3150248 | 3.43614319 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.5268 | 20.831988 | 1.0315464 | 3.74372634 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 9.123676 | 20.831988 | 0.9843 | 2.636427 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 9.37948 | 21.685758 | 0.866184 | 2.57491037 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.782604 | 21.258873 | 0.905556 | 3.40099083 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.5268 | 20.575857 | 1.4095176 | 3.78766679 |
| Catlos2002 | Metamorphic | | Nepel & | | | Electron microprobe | 9.464748 | 21.856512 | 1.3071504 | 2.5485461 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vietnam | | | | | | | |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | | | | | |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.08484 | 22.027266 | 0.5354592 | 9.2274945 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.960736 | 25.015461 | 0.1889856 | 5.1849731 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.999572 | 21.600381 | 0.4015944 | 10.0184226 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.51118 | 24.417822 | 0.1496136 | 4.4819259 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.829036 | 20.49048 | 0.236232 | 9.5790181 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.425912 | 24.247068 | 0.078744 | 3.9546405 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.619664 | 23.649429 | 0.5039616 | 7.5577574 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.534396 | 22.710282 | 0.6142032 | 8.9638518 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.596448 | 22.966413 | 0.5354592 | 10.1941844 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.36386 | 23.734806 | 0.748068 | 5.272854 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.193324 | 24.161691 | 0.748068 | 5.1849731 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 13.131272 | 25.100838 | 0.708696 | 3.6909978 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.36386 | 25.783854 | 0.7638168 | 3.9546405 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.619664 | 25.442346 | 0.7795656 | 4.2182832 |
| Catlos2002 | Metamorphic | | Nepel & | | | Electron microprobe | 10.914304 | 21.258873 | 1.1732856 | 8.6123282 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vietna m | | | | | | | |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 10.5732 32 | 22.2833 97 | 0.34647 36 | 6.1516 63 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 11.5964 48 | 23.6494 29 | 0.58270 56 | 4.4819 259 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 11.4259 12 | 22.7102 82 | 0.81106 32 | 6.5910 675 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 12.1080 56 | 24.5031 99 | 0.72444 48 | 5.8880 203 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 10.0616 24 | 20.1489 72 | 0.25198 08 | 3.5152 36 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 12.7902 | 24.5885 76 | 0.72444 48 | 5.5364 967 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 10.1468 92 | 20.8319 88 | 0.60632 88 | 4.1304 023 |
| Catlos2002 | Metamorp hic | | Nepel & Vietna m | | | Electron microprobe | 11.9375 2 | 23.4786 75 | 0.74019 36 | 5.1849 731 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.425912 | 22.283397 | 0.9528024 | 4.4819259 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.449128 | 24.247068 | 0.6063288 | 4.2182832 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.852252 | 22.624905 | 0.629952 | 6.5910675 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.193324 | 25.100838 | 0.3307248 | 4.0425214 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.170108 | 25.186215 | 0.7244448 | 1.6697371 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.425912 | 24.844707 | 0.7401936 | 2.2849034 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.278592 | 24.673953 | 0.5590824 | 4.1304023 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 13.472344 | 26.46687 | 1.5670056 | 0.7909281 |
| Catlos2002 | Metamorphic | | Nepel & | | | Electron microprobe | 11.681716 | 24.75933 | 1.1575368 | 4.0425214 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vietnam | | | | | | | |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.022788 | 24.332445 | 1.7087448 | 3.8667596 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.278592 | 24.75933 | 1.3150248 | 3.6909978 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.193324 | 24.844707 | 0.4645896 | 4.4819259 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.852252 | 24.503199 | 1.5433824 | 3.6909978 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.278592 | 24.75933 | 1.7559912 | 2.636427 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.534396 | 24.75933 | 1.2047832 | 3.9546405 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.914304 | 22.368774 | 1.1575368 | 3.7788787 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.51118 | 23.649429 | 1.8347352 | 4.1304023 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.619664 | 25.698477 | 0.1811112 | 4.6576877 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.534396 | 24.076314 | 1.023672 | 1.3182135 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 8.697336 | 16.392384 | 1.417392 | 12.9184923 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 9.123676 | 18.697563 | 1.4803872 | 14.5882294 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 9.976356 | 18.612186 | 1.141788 | 13.0063732 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.23216 | 19.892841 | 0.314976 | 12.4790878 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.573232 | 20.234349 | 0.39372 | 10.8093507 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.6585 | 20.831988 | 0.3228504 | 9.8426608 |
| Catlos2002 | Metamorphic | | Nepel & | | | Electron microprobe | 9.37948 | 18.697563 | 0.8425608 | 16.1700856 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vietnam | | | | | | | |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 9.038408 | 18.185301 | 1.102416 | 15.9943238 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.829036 | 19.807464 | 0.354348 | 12.9184923 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 13.64288 | 22.966413 | 0.2913528 | 3.1637124 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 13.301808 | 23.649429 | #VALUE! | 7.3819956 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.766984 | 22.283397 | #VALUE! | 9.7547799 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 9.891088 | 18.185301 | 1.1496624 | 15.2912766 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.596448 | 21.429627 | 0.039372 | 9.9305417 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.193324 | 24.076314 | 0.6063288 | 5.8001394 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.108056 | 23.393298 | 1.0472952 | 5.8001394 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.743768 | 22.112643 | 0.7638168 | 5.1849731 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.573232 | 21.429627 | 2.2914504 | 5.3607349 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 12.108056 | 24.332445 | 0.6220776 | 5.9759012 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 10.999572 | 22.624905 | 2.36232 | 5.5364967 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.255376 | 22.112643 | 2.6457984 | 5.1849731 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.596448 | 23.307921 | 0.5590824 | 6.2395439 |
| Catlos2002 | Metamorphic | | Nepel & Vietnam | | | Electron microprobe | 11.425912 | 23.307921 | 1.0079232 | 5.7122585 |
| Catlos2002 | Metamorphic | | Nepel & | | | Electron microprobe | 11.596448 | 23.137167 | 0.944928 | 5.3607349 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | Vietnam | | | | | | | |
| Cressey1999 | Igneous | Kangankunde | Malawi | | | Electron microprobe | 13.6940408 | 29.4721404 | 0.0078744 | 0.29000697 |
| Cressey1999 | Igneous | Kangankunde | Malawi | | | Electron microprobe | 14.8622124 | 29.455065 | 0.0314976 | 0.15818562 |
| Cressey1999 | Igneous | Kangankunde | Malawi | | | Electron microprobe | 18.929496 | 29.2330848 | 0 | 0.06151663 |
| Cressey1999 | Igneous | Kangankunde | Malawi | | | Electron microprobe | 17.1303412 | 29.2928487 | 0 | 0.10545708 |
| Cressey1999 | Igneous | Kangankunde | Malawi | | | Electron microprobe | 18.2388252 | 29.2330848 | 0 | 0.11424517 |
| Cressey1999 | Igneous | Kangankunde | Malawi | | | Electron microprobe | 14.964534 | 29.0537931 | 0.0236232 | 0.18454989 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 12.449128 | 30.052704 | 0.8819328 | #VALUE! |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 9.720552 | 19.892841 | 0.8031888 | 18.2792272 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 5.3889376 | 16.904646 | 2.8111608 | 7.37320751 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 8.5268 | 24.588576 | 0.472464 | 1.96853216 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 5.243982 | 25.015461 | 0.19686 | 0.39546405 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 5.0393388 | 12.123534 | 1.8977304 | 24.6945329 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 3.8541136 | 12.123534 | 1.7559912 | 20.6520115 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 4.7409008 | 12.465042 | 0.1023672 | 36.7342162 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 13.813416 | 27.747525 | 0.7008216 | 0.13182135 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 15.34824 | 32.101752 | 0.0551208 | 0.68547102 |
| Foseter1998 | Igneous | Erzgebirge - | Germany | | | Electron microprobe | 12.022788 | 21.002742 | 0.3228504 | 19.5095598 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Fichtelgebirge region | | | | | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 7.3245212 | 20.234349 | 3.0080208 | 4.27979983 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 8.0322456 | 18.697563 | 2.2678272 | 5.67710614 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 4.9370172 | 17.160777 | 1.9922232 | 14.2367058 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 7.972558 | 16.733892 | 1.5906288 | 15.9943238 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 10.743768 | 20.063595 | 1.6614984 | 5.72983468 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 6.5059484 | 17.587662 | 3.3938664 | 11.2487552 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 6.3354124 | 17.673039 | 3.6694704 | 9.3153754 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 5.243982 | 15.453237 | 2.2599528 | 16.8731328 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 4.5703648 | 14.855598 | 1.9056048 | 17.1367755 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 5.54242 | 15.026352 | 1.9056048 | 15.9064429 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 4.5106772 | 14.087205 | 2.1103392 | 18.8065126 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 5.3633572 | 15.453237 | 2.0630928 | 13.0063732 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 4.5874184 | 13.916451 | 2.3938176 | 15.2033957 |
| Foseter1998 | Igneous | Erzgebirge - | Germany | | | Electron microprobe | 4.0843372 | 13.233435 | 2.4725616 | 18.3671081 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Fichtelgeb irge region | | | | | | | | |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 3.51304 16 | 11.8674 03 | 1.92135 36 | 20.915 6542 |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 3.58125 6 | 12.3796 65 | 1.72449 36 | 22.145 9868 |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 4.06728 36 | 9.90373 2 | 1.88198 16 | 22.497 5104 |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 2.54951 32 | 6.56549 13 | 1.61425 2 | 31.549 2431 |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 2.65183 48 | 5.46412 8 | 1.64574 96 | 34.097 7892 |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 1.83326 2 | 5.37875 1 | 1.79536 32 | 35.591 7645 |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | | | | |
| Foseter199 8 | Igneous | Erzgebirge - Fichtelgeb irge region | Germa ny | | | Electron microprobe | 1.78210 12 | 4.01271 9 | 1.01579 76 | 35.943 2881 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | #VALUE! | #VALUE! | 0.1417392 | 45.4344253 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | | | | |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 12.193324 | 25.442346 | 1.7559912 | 0.20212607 |
| Foseter1998 | Igneous | Erzgebirge - Fichtelgebirge region | Germany | | | Electron microprobe | 7.1369316 | 17.843793 | 0.9764256 | 16.1700856 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 7.8361292 | 23.1798555 | 1.4410152 | 6.2395439 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 7.5206376 | 22.7871213 | 1.496136 | 6.69652458 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, | Japan | | | Electron microprobe | 2.8735316 | 12.3284388 | 1.1181648 | 4.43798545 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | Shirakawa, Gifu … | | | | | | | | |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 2.4898256 | 11.7734883 | 1.0551696 | 5.43982771 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 4.6726864 | 19.1671365 | 3.661596 | 7.030472 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 4.5788916 | 19.2610512 | 4.0080696 | 6.93380301 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 7.333048 | 21.1564206 | 1.7166192 | 5.21133737 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 6.9408152 | 20.5075554 | 2.2127064 | 4.59617107 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa, Shirakawa, Gifu … | Japan | | | Electron microprobe | 8.5012196 | 23.7689568 | 0.2126088 | 7.31169088 |
| Hoshino2012 | Igneous | Tanzawa, Kanagawa | Japan | | | Electron microprobe | 7.3415748 | 22.4712264 | 2.1024648 | 4.05130949 |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | , Shirakawa, Gifu … | | | | | | | | |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 11.1445276 | 24.1873041 | 1.2362808 | 4.60495916 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 12.3041724 | 25.4679591 | 0.5197104 | 3.90191196 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 0.8185728 | 1.195278 | 0.1102416 | 0.1757618 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 12.2444848 | 24.6654153 | 0.19686 | 4.2182832 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 11.6902428 | 22.4968395 | 0.944928 | 9.34173967 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 10.615866 | 22.7615082 | 1.3622712 | 4.86860186 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 10.2236332 | 22.7358951 | 1.7166192 | 4.34131646 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 12.1251096 | 26.2875783 | 0.1417392 | 2.86491734 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 12.2444848 | 25.9119195 | 0.1023672 | 3.91948814 |
| Nagy2001 | Metamorphic | Sopron Hills | Eastern Alps | | | Electron microprobe | 14.623462 | 28.1402592 | 0.0236232 | 4.36768073 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.2421204 | 28.5073803 | 0.3464736 | 1.44124676 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.94154 | 23.9643 | 0.166328 | 2.65568 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.02885 | 25.5227 | 0.117004 | 1.95653 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.97105 | 25.4081 | 0.106763 | 1.86668 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.6597 | 28.5447 | 0.179912 | 0.729049 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.9105 | 27.6571 | 0.147786 | 0.262463 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.6687 | 29.3666 | 0.10156 | 0.057556 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.9715 | 29.7319 | 0.134342 | 0.091565 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.6462 | 29.2602 | 0.246488 | 0.034559 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.3013 | 21.8806 | 1.85251 | 8.74616 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.96815 | 21.0618 | 2.17478 | 7.5475 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.77016 | 21.4244 | 2.35713 | 8.52656 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.6977 | 22.3554 | 2.12992 | 7.13411 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.7307 | 29.6171 | 0.206773 | 0.16245 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.4002 | 29.1068 | 0.360489 | 0.087976 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.417 | 29.6157 | 0.361631 | 0.040862 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.4529 | 29.528 | 0.240397 | 0.135276 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.2631 | 28.4185 | 0.415543 | 0.037868 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.8954 | 28.4969 | 0.436045 | 0.027395 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.7852 | 28.5472 | 0.454408 | 0.036345 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.7387 | 28.5005 | 0.439981 | 0.012643 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.8733 | 28.4169 | 0.415828 | 0.020605 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.6859 | 28.3119 | 0.462463 | 0.000924 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 5.65785 | 20.1248 | 0.265402 | 0.397113 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 5.34778 | 19.7695 | 0.187223 | 0.431175 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 5.4128 | 19.5209 | 0.186671 | 0.390945 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.2016 | 28.831 | 0.399186 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.7564 | 28.9224 | 0.309571 | 0.003892 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.8115 | 28.8564 | 0.292764 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.4112 | 28.9178 | 0.357547 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.0355 | 28.9176 | 0.310656 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.5473 | 28.9185 | 0.414867 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 3.87462 | 19.2557 | 0.143573 | 0.619093 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.7695 | 28.8821 | 0.348888 | 0.003904 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.2731 | 29.0161 | 0.337518 | 0.014714 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.3789 | 28.6187 | 0.332616 | 0.01577 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.5734 | 29.1109 | 0.246219 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.0185 | 29.0213 | 0.278113 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.54 | 29.5621 | 0.233639 | 0.2452 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 12.5087 | 28.9943 | 0.25252 5 | 0.2770 53 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 13.8398 | 28.9516 | 0.39206 9 | 0.0273 18 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 14.3064 | 29.325 | 0.38269 4 | 0.0591 31 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 14.006 | 29.0547 | 0.41695 7 | 0.0523 05 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 14.5877 | 28.314 | 0.46384 7 | 0.4656 39 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 15.717 | 30.003 | 0.34942 8 | 0.1536 36 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 16.1627 | 27.1788 | 0.23049 1 | 0.6646 28 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 16.944 | 27.4808 | 0.26188 7 | 0.78110 6 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 13.2394 | 28.7244 | 0.43302 2 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.2643 | 21.9921 | 2.16318 | 7.7230 1 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.6961 | 22.5787 | 2.08699 | 6.9737 5 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.7714 | 22.6232 | 1.96282 | 7.0144 6 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.648 | 22.5389 | 1.97604 | 7.143 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.3283 | 22.4051 | 2.13053 | 7.3585 8 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.8814 | 22.6398 | 1.91243 | 7.0947 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.1294 | 21.7184 | 2.31067 | 7.7535 6 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.1709 | 21.9507 | 2.51697 | 6.9959 7 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.3173 | 22.1184 | 2.79629 | 6.6139 1 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.3083 | 21.9576 | 2.87863 | 6.6048 6 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.3069 | 21.8071 | 2.90621 | 6.6634 9 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.351 | 21.8227 | 2.91989 | 6.7094 5 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.569 | 22.3684 | 2.25965 | 6.8946 6 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 10.4764 | 22.1053 | 2.85807 | 6.6296 7 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 15.8816 | 27.5737 | 0.42708 2 | 0.4284 74 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 15.9608 | 26.9038 | 0.32630 8 | 0.5474 84 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 14.0006 | 23.7965 | 4.9477 | 0.6843 1 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 15.6047 | 26.97 | 0.39626 | 0.6239 03 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 16.631 | 27.1165 | 0.20139 3 | 0.9375 87 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 17.9831 | 30.3549 | 0.26638 4 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.0767 | 30.4626 | 0.19724 6 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.1923 | 30.1796 | 0.17596 4 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 17.9564 | 30.2165 | 0.16003 4 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 17.9301 | 29.9798 | 0.23982 9 | 0.0261 93 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 16.4565 | 28.8942 | 0.43489 5 | null |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.6257 | 30.0669 | 0.198248 | 0.047592 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.896 | 30.0496 | 0.238714 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.0655 | 30.0608 | 0.223545 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.1589 | 30.136 | 0.175576 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.5371 | 29.3709 | 0.185029 | 0.097058 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.0449 | 28.5872 | 0.284885 | 0.087277 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.7929 | 28.7668 | 0.305193 | 0.04906 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.0692 | 28.2984 | 0.304945 | 0.102401 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.0905 | 29.2233 | 0.518501 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.5095 | 29.2761 | 0.434483 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.6823 | 28.6627 | 0.291702 | 0.123473 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.5508 | 30.4452 | 0.344939 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.1037 | 29.8233 | 0.365187 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.35087 | 25.4725 | 0.146232 | 0.933148 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.7844 | 29.8007 | 0.343179 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.3067 | 30.1542 | 0.164633 | 0.036591 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.2434 | 30.2321 | 0.19813 | null |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.7021 | 28.124 | 0.167951 | 0.297129 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.2384 | 27.3863 | 0.433172 | 0.082203 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.2886 | 27.9516 | 0.17757 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.347 | 25.9003 | 0.422879 | 0.281577 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.6098 | 29.1733 | 0.313721 | 0.039567 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.7502 | 28.4876 | 0.252325 | 0.29597 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.1869 | 28.7023 | 0.459822 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.5808 | 28.4509 | 0.359453 | 0.048832 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.3256 | 28.3528 | 0.279684 | 0.18326 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.3956 | 28.5841 | 0.293058 | 0.165021 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.6312 | 28.0462 | 0.238431 | 0.36529 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.5713 | 27.8469 | 0.272837 | 0.290788 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.0516 | 27.3598 | 0.209554 | 0.158109 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.1921 | 29.0634 | 0.422657 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.5166 | 28.9184 | 0.312267 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.0287 | 28.1102 | 0.534282 | 0.633067 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.1002 | 28.1295 | 0.516073 | 0.634108 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.80088 | 28.4518 | 0.495187 | 0.436619 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.68447 | 27.2284 | 0.537982 | 0.877132 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.80059 | 27.6988 | 0.579997 | 0.641188 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.7376 | 27.0751 | 0.760902 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.0483 | 26.5845 | 0.142031 | 0.269425 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.9704 | 28.0997 | 0.172503 | 0.116706 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.9375 | 30.2469 | 0.165519 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.3582 | 30.1382 | 0.247507 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.4981 | 30.1264 | 0.204461 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.26475 | 32.0386 | 0.101144 | 0.719754 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.2987 | 29.5127 | 0.158734 | 0.71789 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.109 | 29.4313 | 0.353564 | 0.440015 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.1696 | 29.8347 | 0.229767 | 0.03691 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.1273 | 29.8154 | 0.279264 | 0.034251 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.704 | 29.897 | 0.288124 | 0.05337 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.3068 | 30.1475 | 0.198337 | 0.026709 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.5017 | 29.997 | 0.233076 | 0.026952 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.9977 | 30.0008 | 0.231397 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.2455 | 30.3116 | 0.147846 | 0.027219 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.1309 | 30.2001 | 0.150202 | 0.036748 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.4341 | 30.0564 | 0.246373 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0464 | 30.4019 | 0.112077 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0253 | 30.3311 | 0.173707 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.6436 | 29.9617 | 0.20083 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.6631 | 30.0652 | 0.227525 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.5599 | 32.2973 | 0.092761 | 0.717405 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.1575 | 32.4107 | 0.092396 | 0.783164 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.39632 | 31.8536 | 0.073906 | 0.820207 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.1427 | 31.9931 | 0.159744 | 0.756243 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.2682 | 32.8806 | 0.146398 | 0.399336 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.0825 | 32.2144 | 0.135026 | 0.721943 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.97589 | 21.612 | 1.97357 | 7.43444 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.64779 | 21.9192 | 1.8357 | 7.37637 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.4018 | 30.6373 | 0.164333 | 0.479711 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 17.3172 | 31.3985 | 0.20405 1 | 0.47113 9 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 9.48327 | 32.0968 | 0.12220 3 | 0.6438 95 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 9.30833 | 31.4883 | 0.07581 7 | 0.9153 2 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 15.4855 | 29.5971 | 0.32881 3 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 13.3697 | 30.183 | 0.25528 4 | 0.2096 46 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 13.1545 | 28.3965 | 0.47815 5 | 0.0743 17 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.3802 | 30.0367 | 0.16440 2 | 0.0296 24 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.7608 | 30.2811 | 0.13303 9 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.5862 | 30.0241 | 0.16345 5 | 0.0414 47 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.6071 | 29.7307 | 0.13841 7 | null |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 18.8167 | 29.8053 | 0.13761 3 | 0.0513 84 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 6.54138 | 26.3228 | 0.15017 1 | 0.3215 66 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 5.66909 | 25.6976 | 0.15883 9 | 0.1927 59 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 20.6854 | 28.6847 | 0.31471 1 | 0.0867 02 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 8.11833 | 27.8736 | 0.17213 4 | 0.1789 69 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 7.419 | 27.6307 | 0.11864 | 0.8082 7 |
| McFarlane 2009 | Metamorp hic | Broken Hill | Austral ia | | | Electron microprobe | 9.33515 | 31.7248 | 0.18279 2 | 0.4752 43 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 6.00554 | 27.6481 | 0.130032 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 5.78232 | 27.0178 | 0.102233 | 0.184756 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.7774 | 26.577 | 1.23412 | 1.133 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.4611 | 29.4748 | 0.330451 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.685 | 29.258 | 0.248677 | 0.064219 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.201 | 26.2158 | 0.26611 | 3.71302 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.237 | 22.5491 | 1.83221 | 8.54931 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.5361 | 21.8945 | 1.81686 | 8.28059 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.4968 | 23.2189 | 1.21401 | 6.01925 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.4521 | 26.5183 | 0.40725 | 0.967072 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.82568 | 25.2283 | 0.200159 | 1.57555 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.2922 | 27.2667 | 0.28769 | 0.545852 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.2477 | 28.6626 | 0.479013 | 0.09857 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.0032 | 27.877 | 0.200512 | 0.575005 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.20875 | 26.0749 | 0.104834 | 1.06029 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.1947 | 28.0309 | 0.692906 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.1367 | 27.8066 | 0.685847 | null |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 20.6224 | 26.6366 | 0.514957 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.5979 | 27.4288 | 0.512258 | 0.139281 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0737 | 27.18 | 0.520084 | 0.068893 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.8241 | 27.2477 | 0.324119 | 0.327105 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.2405 | 27.9182 | 0.334709 | 1.147 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.6867 | 28.8155 | 0.339311 | 1.00096 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.3188 | 28.1602 | 0.343647 | 1.12344 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.5194 | 26.9241 | 0.220937 | 1.39907 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.4722 | 29.348 | 0.455948 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.5677 | 29.579 | 0.275117 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.6585 | 30.1963 | 0.269862 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.4778 | 30.0543 | 0.301945 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.2517 | 29.2197 | 0.503979 | 0.257172 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.9997 | 29.2754 | 0.472809 | 0.267958 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 14.1809 | 28.8946 | 0.627267 | 0.055009 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.2191 | 29.5746 | 0.102066 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.1855 | 29.8163 | 0.102403 | null |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.4617 | 29.6023 | 0.218937 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.058 | 29.8441 | 0.170804 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.3324 | 29.7073 | 0.111202 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.2466 | 29.873 | 0.123918 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.6898 | 29.3672 | 0.221834 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.4918 | 29.6652 | 0.224513 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.6434 | 29.2576 | 0.208738 | 0.025191 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.6453 | 29.2474 | 0.196967 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.2697 | 29.4898 | 0.161209 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.7123 | 29.2176 | 0.211835 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.45734 | 26.8448 | 0.115126 | 0.050475 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0846 | 29.4421 | 0.199652 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.5288 | 29.4407 | 0.229723 | 0.055208 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.5805 | 28.94 | 0.257292 | 0.098084 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.3609 | 29.797 | 0.088031 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.1823 | 29.7696 | 0.140994 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.5756 | 29.7901 | 0.171579 | null |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.7164 | 30.2074 | 0.261449 | 0.15054 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.6164 | 28.1352 | 0.207588 | 0.225384 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.58446 | 27.6634 | 0.094748 | 0.107044 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.04082 | 26.589 | 0.114869 | 0.114189 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.9699 | 29.9672 | 0.30387 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.5666 | 30.0138 | 0.369632 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.1449 | 29.7948 | 0.321468 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 6.37502 | 25.4745 | 0.132811 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.65706 | 25.6363 | 0.119698 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.0596 | 28.7933 | 0.169347 | 0.03076 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.46402 | 26.9002 | 0.101192 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.5784 | 28.4935 | 0.152483 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.31671 | 27.0465 | 0.107353 | 0.044577 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0627 | 29.7701 | 0.118576 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.876 | 29.8075 | 0.152401 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0789 | 29.6921 | 0.130921 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0663 | 29.5698 | 0.131807 | 0.042853 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.2569 | 30.0313 | 0.155513 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.2591 | 29.5679 | 0.089057 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 6.92425 | 27.4151 | 0.084024 | 0.057786 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 19.0287 | 30.129 | 0.155877 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 15.4496 | 28.928 | 0.47953 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.9219 | 30.301 | 0.131181 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.29413 | 27.2895 | 0.107006 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 6.92664 | 26.9484 | 0.140182 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.14346 | 26.7832 | 0.134746 | 0.065725 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.0304 | 29.9153 | 0.210704 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 16.7187 | 29.7187 | 0.180651 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.9579 | 29.9217 | 0.19578 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 18.2646 | 29.9025 | 0.169873 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.41492 | 27.295 | 0.079581 | 0.062814 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.9453 | 29.967 | 0.182466 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.72466 | 27.6186 | 0.073409 | 0.054645 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.23502 | 28.3709 | 0.088194 | 0.151473 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.29 | 28.9249 | 0.133572 | 0.086428 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.6885 | 29.7679 | 0.133301 | null |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 6.51308 | 26.4328 | 0.135912 | 0.066908 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 17.7277 | 29.2755 | 0.229355 | 0.053041 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.9815 | 28.4154 | 0.175885 | 0.304 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.574 | 29.1257 | 0.237185 | 0.151092 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.5618 | 28.6546 | 0.208459 | 0.226726 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.0464 | 29.3563 | 0.230992 | 0.216238 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 12.4405 | 28.7333 | 0.218402 | 0.263803 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 13.6868 | 28.8498 | 0.272888 | 0.155812 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.1643 | 28.7597 | 0.178915 | 0.266201 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.7668 | 28.4862 | 0.189066 | 0.253638 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.762 | 28.6355 | 0.187105 | 0.232883 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.8309 | 22.9561 | 2.2469 | 6.37716 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.0477 | 22.9287 | 2.15933 | 6.27664 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 11.0805 | 28.9358 | 0.083496 | 0.645158 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.84492 | 29.3233 | 0.103834 | 0.032857 |

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|---|---|---|---|---|---|---|---|---|---|---|
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.4487 | 29.8568 | 0.108243 | 0.174683 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.35185 | 29.1967 | 0.129567 | 0.126774 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.25733 | 29.5638 | 0.094065 | 0.080293 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.11255 | 27.5449 | 0.12783 | 0.448285 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.05835 | 26.5396 | 0.146586 | 0.341465 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.9801 | 28.1049 | 0.107282 | 0.342567 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 7.9645 | 27.488 | 0.13433 | 0.283838 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.29365 | 29.3512 | 0.048602 | 0.50731 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.12387 | 28.7036 | 0.074217 | 0.490008 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 10.37 | 29.528 | 0.091341 | 0.187317 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 8.76861 | 29.6193 | 0.060367 | 0.457373 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.5679 | 29.621 | 0.096331 | 0.360707 |
| McFarlane 2009 | Metamorphic | Broken Hill | Australia | | | Electron microprobe | 9.12438 | 29.8537 | 0.054497 | 0.754063 |