The Beraunite Mess

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A Van King photo of ferroberaunite posted on mindat August 1, 2022 caught my attention. It seems that the greenish acicular sprays that I/we have been labeling as beraunite for decades is now ferroberaunite and what was briefly defined as eleonorite, the reddish-brown version, is now beraunite. The eleonorite name is now discredited. The beraunite page on mindat.org states:

"Named by August Breithaupt in 1840 for the town of Beroun (Beraun) near the type locality at the Hrbek Mine, Svatá Dobrotivá (St Benigna), Beroun (Beraun), Bohemia, Czech Republic. Beraunite was redefined by Fanfani and Zanazzi (1967), on the basis of a crystal structural analysis, as a mixed-valence iron phosphate and they left the original fully oxidized end-member unnamed. In essence, they had discovered a new mineral species (ferroberaunite; later defined by Tvrdý et al., 2021) but they re-used an existing name for a different composition (beraunite). Eleonorite was later defined by Chukanov et al. (2017) as the oxidized end-member of the beraunite-ferrobraunite series (previously also called "oxyberaunite") but is now discredited. Both beraunite and eleonorite had previously been applied to the fully oxidized mineral. Subsequently, Vrtiška et al. (2022), based on a restudy of the type material, redefined beraunite as the oxidised phase and discredited eleonorite."

Vrtiska's 2022 article on the re-definition of beraunite (European Journal of Mineralogy 34: 223-238) is available on the web: https://ejm.copernicus.org/articles/34/223/2022/ejm-34-223-2022.pdf .

The formula difference between beraunite and ferroberaunite is just a change in the oxidation state of one of six iron atoms, coupled with a charge balance adjustment of the hydroxide component. This difference is undetectable by EDS analysis. The sophisticated analytic techniques required to determine this difference are far beyond the reach of the amateur collector.

Beraunite chemistry is $Fe^{3+}_{6}(PO_4)_4O(OH)_4 \cdot 6H_2O$

Ferroberaunite chemistry is $Fe^{2+}Fe^{3+}_{5}(PO_4)_4(OH)_5 \cdot 6H_2O$

This species re-definition causes substantial pain for mineral collectors. My cataloged micro collection has 27 specimens of beraunite from four different New Hampshire localities. All these need to be re-labeled and their catalog entries changed. My mindatnh.org web pages need substantial rework. The species eleonorite, the brownish-reddish variant, was accepted as valid by the IMA in 2017 and remained so for several years. I was late in switching my "oxidized beraunite" specimens to eleonorite, finally completing the task in the spring of 2020. This is now a wasted effort. I suspect our MMNE members have acquired dozens of beraunite specimens from our sales, auction, and give-away tables over the years, so I am not alone in this re-labeling activity.

Figures 1 and 2 illustrate the species that the IMA now defines as beraunite. These specimens were previously labeled as eleonorite in my collection.

Figure 1: Beraunite Palermo Mine, Groton, NH
3.5 mm field of view

Figure 2: Beraunite Chickering Mine, Walpole, NH
1.1 mm field of view

Figures 3 and 4 are examples of what the IMA now accepts as ferroberaunite.

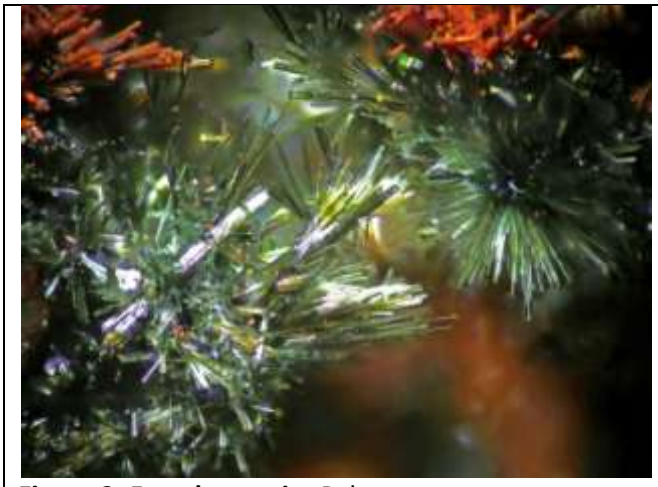

Figure 3: Ferroberaunite Palermo #1 Mine, Groton NH
5 mm field of view

Figure 3: Ferroberaunite Palermo #1 Mine, Groton NH
6 mm field of view

Jim Nizamoff forwarded the following thoughts on this topic after reviewing this brief article:

The IMA commission on new mineral names has been doing similar permutations for the last ten years or so. It appears some of the committee members enjoy this sort of thing. In some cases it makes sense to do this as quite a few of the species in question were described many years ago and may not have been completely accurately characterized due to the analytical limitations of the day. Beraunite is one example and rockbridgeite, ferrorockbridgeite and ferrirockbridgeite (Palermo is type location for ferrirockbridgeite) also fall into this category. I agree that it is a pain to re-label, but in this case it appears it is for a good reason. Without strong analytical data I suggest to label as a series (childrenite-eosphorite) or use the group name in quotations ("jahnsite").