

# Is bronzite a variety of enstatite, or is it a rock?

Donald Kasper, 8-13-2017

For the rock material called bronzite we get this from two major online mineral sources, and the scientific literature:

## 1. Wikipedia

Bronzite is a member of the pyroxene group of minerals, belonging with enstatite and hypersthene to the orthorhombic series of the group. Rather than a distinct species, it is really a ferriferous variety of enstatite, which owing to partial alteration has acquired a bronze-like sub-metallic luster on the cleavage surfaces.<sup>[1]</sup>

## 2. Mindat

Formula:  $(\text{Mg,Fe}^{2+})_2[\text{SiO}_3]_2$

A variety of Enstatite

A ferroan variety of enstatite

## 3. Literature.

The third compositional identity of bronzite comes from research papers studying interstellar silica minerals and including glassy enstatite found in chondrites. This is identified as an enstatite.

Terrestrial bronzite is a yellowish metallic rock with multiple particle flakes defined as a pyroxene mineral like enstatite or hypersthene. The Wikipedia definition then confuses an argument about hypersthene and its historical meaning where it is stated that hypersthene is not a ferrosilite (iron end member), but is more often a ferroan enstatite in the middle of this series.

Bronzite beads in infrared:

Armed with a sample of gem hypersthene, infrared conclusively shows that terrestrial bronzite has nothing to do with hypersthene, and hence mineralization in the enstatite group (see below). As such the Mindat statement that bronzite is a varietal look of enstatite is an urban myth that made its way into the pages of this web site, which we have seen in this report series, has been noted before.

Meanwhile, over at the following blog: <http://mineralbliss.blogspot.com/2011/06/cummingtonite-amphibole-anthophyllite.html>, the question is about mineral samples from Maryland, described variously by geologists as cummingtonite, amphibole-anthophyllite, and bronzite. This confused the blog poster as he interpreted bronzite to be an enstatite, citing Mindat.

This confusion is expected as the infrared graphs of the author show quartz, mineralization close to cummingtonite and anthophyllite (which form a compositional series), aegirine, with matching 3 of 4 water bands to the mineral glaucophane. Infrared of my enstatite beads samples conclusively shows no enstatite.

Conclusion:

Mindat used the International Mineralogical Association (IMA) mineral list for its mineral identifications, then adds in common mythology of varieties derived from any source, confuses material that are rocks as minerals, and intermixes them with IMA data. In addition to that, scientists to this day publish using mineral names IMA does not approve of including anorthoclase, phengite, and hypersthene. There are also disputes in the literature whether sanidine is a unique feldspar, something that IMA accepts as a mineral. Reliance on just IMA as the only authority and ignoring the modern scientific literature limits the scope of the web site usefulness.

Material sold as bronzite in infrared match the description of some online authors as pyroxenite, a mixed rock of various pyroxenes, with quartz. A mineral slice purchased by the author that looked like a gold colored schist or phengite could

be a “bronzite” that has mostly quartz and another amphibole close to aegirine. It has so much quartz, the amphibole may never be identified.



Enstatite candidate bead, one of several scanned in multiple areas using infrared, by the author.

Enstatite candidate bead (red graph), versus hypersthene (ferrosilite) violet graph (Reflectance)  
There is no match. Hypersthene is the iron-rich relative of enstatite.

The large peak above 1000 cm<sup>-1</sup> is typical for several inosilicates, but not enstatite.

