

Mineralogy Boot Camp Session #23

Mineralogical Information Sources

Learning to identify and appreciate minerals requires relying on references and other sources of reliable information. The nature of these sources will depend on one's level of mineralogical knowledge, either as a beginner or an advanced student.

A commonly-used method for beginners to start mineral identification is by comparing unknown specimens with photographs in books or online sources. Hopefully you realize, however, that frequently the size, shape and color of specific minerals can vary considerably and so this is a poor method of starting. [Plus recognize that typical mineral photographs in these references are of museum-quality specimens, which is not likely to be what you're holding in your hand.] As described in Boot Camp sessions 3, 4, and 5, the physical properties of minerals outside of just their color are far more reliable an indicator of a mineral's true identity. Avoid the temptation to identify a mineral using just one property.

References that include both descriptions of a mineral's physical properties and common modes of occurrence in addition to a photograph are the most useful resource. It is also recommended that more than one source be consulted, because each source will have its own strengths and weaknesses. References can be grouped into a few large categories, as described below.

“Handbook” Style

These books are often a reduced size, making it easy to hold open in one hand. Numerous publishers have these on the market. [The physical properties of minerals were established in the late 19th century, so this data was well established a long time ago. Make your selection based on the ease of understanding the writing style, overall organization of the book, and quality of the photographs, not how recently it was published.] The handbook (or guidebook) type of reference is often available in used book stores where it can be acquired for a fraction of what a new book costs. Presumably this reference will be used often, so make sure it has a good binding. A personal favorite of this style is *Audubon Society Field Guide to North American Rocks and Minerals*. In addition to an abundance of high-quality photographs, the physical properties for each mineral are clearly listed. Introductory information is given concerning the physical properties and how to test or observe them.

“Encyclopedia” Style

Commonly in an oversized format, these books are often filled with a multitude of photographs but are quite limited in information on physical properties. In an attempt to be exhaustive by including common plus obscure minerals, such books sacrifice other more useful characteristics of the more common minerals such as hardness, specific gravity, streak, cleavage, etc. While

nice to thumb through, “encyclopedia” style references are often of very limited help in actually identifying an unknown mineral.

“Textbook” Style

This is the type of book likely to be used in a university-level Mineralogy course. While practicing geologists should have such a reference on their bookshelf, it would be a difficult place to begin your studies without the necessary background and experience provided by such a class and thus are not recommended as a starting place for the novice. These types of references typically do have very detailed descriptions of the common minerals, plus most provide several tables of physical property data arranged so as to provide an organized strategy for determining unknown specimens. One common textbook used in Mineralogy courses is *Manual of Mineralogy* by Klein and Hurlbut. This book has been through over 20 editions and used for so many years (since the mid-1970s) that older editions are not hard to locate.

Online References

Resources available in an online format through a laptop or smartphone are numerous, and as might be expected, with a wide range in their usefulness. In general these websites are set up either as a method to identify particular minerals using their physical properties, or as an “inventory” of mineral species with detailed descriptions and photographs. Of the latter group, a personal favorite is www.mindat.org, run by the not-for-profit Hudson Institute of Mineralogy in Virginia. Their goal is to be the world’s largest open database for minerals, rocks and meteorites. The site currently contains over 5,900 mineral species, 3,000 rocks, and 1.2 million photographs in a user-friendly format containing physical, optical, and chemical properties, name origin, occurrences, and so forth.

The United States Geological Survey (www.USGS.gov) among its numerous missions is the leading collection center for rock and mineral production data both in the U.S. and worldwide. The specific production amounts and dollar values cited elsewhere in previous Mineralogy Boot Camp sessions comes from their Commodity Statistics and Information page ([Commodity Statistics and Information | U.S. Geological Survey \(usgs.gov\)](http://www.usgs.gov/commodity)). Annual production data for 84 non-fuel mineral commodities can be found here, along with reports on mineral production for individual states and countries.

“Live” Resources

As the title of this section implies, these resources involve getting out of the house and probably interacting with other humans. But this also gives one the opportunity to observe actual specimens, which is an important exercise in the process of learning to identify both rocks and minerals. For example, all U.S. states and many larger cities have some form of a science or natural history museum where mineral specimens are displayed. Many universities with geology

programs also have a small museum or maybe display cases in hallways that contain minerals for viewing.

Every state has at least one rock and mineral club, where enthusiasts meet on a regular basis; many of these clubs also arrange field trips where members can collect specific items. The American Federation of Mineralogical Societies keeps a list of such clubs on their website ([Club Sites \(amfed.org\)](http://amfed.org)). Many clubs also have annual gem and mineral shows with vendors, where hundreds if not thousands of specimens are displayed, and most are available for purchase by attendees. There's a wide range in quality, size, and price of these specimens, but it's worth the minimal entry fee just to peruse the tables in order to build your own experience with the range in visual appearances of particular minerals.