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Atlas of Non-Silicate Minerals in Thin Section

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In the distant past of my student days, I wrestled with petrology and optical mineralogy, as did most of my classmates, always seeking that elusive "Ah-ha!" moment of clarity. We labored long hours preparing thin sections by hand on massive glass plates sprinkled with silicon carbide grit, wishing that there were some easier route to thin section enlightenment. It would not be until some thirty-plus years later that MacKenzie and Adams published their handy *Color Atlas of Rocks and Minerals in Thin Section* that students would have an easier time of recognizing and comparing, through a well-conceived published color reference, some basic rocks and a sampling of fundamental rock-forming minerals in thin section. If only this latest title, *Atlas of Non-Silicate Minerals in Thin Section*, had existed then, I might have thrived as a petrologist instead of just a lover and hawker of rare, ugly minerals!

The marvelous new book, the *Canadian Mineralogist's* Special Publication No. 7, builds and expands upon several earlier works that received financial support from the Folch Foundation for publication of the earlier Spanish and Catalan editions, now out of print. Its hardcover, large format pages (11.5" x 8.5") are elegantly presented, with over 500 pages, most in full color, containing a wealth of data. Over four hundred (408 to be precise) non-silicate minerals are presented in great detail, not only with important mineralogical and optical data, but also with excellent color images of appropriate thin sections in plane-polarized light, cross-polarized light and often at various stage rotations.

The authors have expanded beyond the traditional 200 or so "rock forming minerals" to include critical associated species, and this emphasis on a wider view of what constitutes a true rock forming phase extends perfectly into a novel treatment of these petrographically important, non-silicate phases. Embracing a broader stance of mineral diversity in its treatment, this groundbreaking book is able to capture and present important aspects of the conditions of mineral formation as well as the textual relationships that are seen in thin section. And all of this without a silicate in sight!

After a solid introductory chapter of some twenty (20) pages, the authors employ a slightly modified Dana classification scheme that has the welcome benefit of grouping structurally similar minerals together, segmenting the 408 minerals into sixteen (16) crystal-chemical classification chapters. These chapters contain the exhaustive descriptive work and images of the non-silicate minerals selected, and they account for nearly 95% of the book's 521 pages.

Each crystal chemical classification chapter opens with a brief definition of the classification, lists its included members, summarizes their optical properties, occurrence, petrogenetic and/or metallogenic implications, environmental implications, industrial applications and/or economic importance and closes with some basic references. Following the opening summaries, individual minerals are presented in Dana classification sequence.

For each species, at least two, and more commonly three thin section images are offered, all in full color. Images are fully captioned in great detail, improving their usefulness immensely. For every species, the authors have extracted important technical data, including chemical formula, crystal system, space group, relationship to other species, typical analytical components, unit cell parameters, strongest diffraction lines and intensities, optical constant, habit, relief, color, pleochroism, cleavage, alterations (excellent!), orientation, twinning, zoning, interference figure, distinguishing features, and more! Mode of occurrence is also given solid treatment. In addition, detailed references and structural references are provided for every chosen mineral.

To test the usefulness of all the descriptive detail, I randomly selected several thin sections, ran to my Leica, and tested the data. Yes! Colorless cerussite does have high orders of interference colors but pleochroism is absent, while anglesite can indeed be differentiated from cerussite by its interference figure. Likewise, uniaxial anatase is easily distinguished from its chemical trimorph brookite, which is biaxial! My SEM/EDS is helpless with similar mineral ID problems, but a reawakened optical eye is not. Clarity at last! While this sort of technical information has always been available, this is one of the few times I can recollect that it is presented so concisely in a "distinguishing features" discussion about a given mineral, particularly when viewed in thin section.

The book closes with an index of minerals, followed by an index of localities (in alphabetical subsets by country), both quite useful. This wonderful volume will go to my “frequent reference” shelf in the lab, and I expect it will see constant use as my rusty optical skills reemerge. And the most exciting news of all: the authors are working on a similar volume for silicate minerals. I can hardly wait!

The book is available from the Mineralogical Association of Canada (490, de la Couronne, Quebec, QC G1K 9A9, Canada), priced at $100.00 U.S. for members, and $125.00 for non-members. Surface shipping to the USA is an additional $16.00 for each. The MAC website is: http://www.mineralogicalassociation.ca

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