Metamorphism of Siliceous Dolostone: An Example from the Alta Stock, Utah

Cameron Davidson and Bereket Haileab
Department of Geology, Carleton College
One North College Street, Northfield, Minnesota 55057

Instructor's Notes

This exercise is based on a suite of rocks collected by Bereket Haileab (Carleton College) from the contact metamorphic aureole of the Alta stock near Salt Lake City, Utah. The Alta stock is a Tertiary (~38 Ma) granodiorite that intruded Paleozoic dolostone containing chert nodules (Cook and Bowman, 2000). We designed the exercise so that it can be used without access to rocks and thin sections from the contact aureole. However, access to real thin sections is always a plus.

This exercise is constructed for a mid to upper level undergraduate petrology course. It assumes students have already had a course in mineralogy and are familiar with photomicrographs, plotting mineral compositions on ternary diagrams, the phase rule, and Schreinemaker's rules. Some of these concepts (e.g., Schreinemaker's rules) could be introduced as part of this activity.

Parts I and II should be completed and turned in to the instructor before handing out Part III. This allows the instructor to make sure the students are on the right track before they complete the more open-ended questions in Part III. In addition, there is information in the Part III instructions we want them to derive on their own in Parts I and II.

Files associated with this exercise:

1. AltaStockExercise.pdf: Handout given to students.

2. AltaStockNotes.pdf: Instructor's notes (this document).

3. AltaStockSolutions.pdf: Solution set.

4. PhotoMicros.zip: Various high-resolution photomicrographs from the contact aureole including those used in Figure 3.

Reference

Cook, S.J. and Bowman, J.R. (2000) Mineralogical evidence for fluid-rock interaction accompanying prograde contact metamorphism of siliceous dolomites: Alta Stock Aureole, Utah, USA. Journal of Petrology, 41, 739–757.