WORKING WITH ELECTRON MICROPROBE DATA FROM A HIGH PRESSURE EXPERIMENT – CALCULATING MINERAL FORMULAS, UNIT CELL CONTENT, AND GEOTHERMOMETRY

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NOTES TO THE INSTRUCTOR

This exercise provides students the opportunity to work with real microprobe data to perform a series of common calculations. It also provides a brief glimpse into a high-pressure experiment. (I hope to expand this opportunity in the future via web activities…stay tuned.) The exercise can be used as a laboratory activity or a problem set. It is ideally suited for the use of a spreadsheet like Excel, but can be completed by hand. This is a great opportunity for students who are unfamiliar with spreadsheets to get their feet wet. For me, trial by fire is the best way to learn a new software program.

The exercise could be used in any undergraduate petrology or mineralogy course and assumes only a general background in mineral chemistry. The goals are for students to: 1) work with real data from an experiment, 2) learn/remind themselves of the relationship between chemistry and crystal structure as displayed in mineral formula, 3) use a geothermometer to see how phase equilibria can be used to decipher physical properties of rocks.

The exercises include:

- Mineral formula recalculation
- Unit cell content calculation
- Calculating end-member percentage
- Plotting data on a ternary plot
- Geothermometer calculation

The exercise could easily be modified to include other "pet" analyses or questions.

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