

Geology 221a – Mineralogy

Unit Cell Assignment

Use the powder diffractometer and Scintag software to determine the unit cell of your project mineral. The completed assignment should be a brief report that includes the following:

- (1) A printed powder diffraction pattern for your mineral with (hkl) labels for the important peaks. The pattern should be collected at a scan rate of $1^\circ 2\theta$ per minute or slower over a range of 2θ from 5° to 75° or greater, as appropriate for your mineral.
- (2) An Excel table containing a list of the important peaks that includes: (hkl) assignment, 2θ value to 0.01 degrees, d-value to 0.001, relative intensity on a scale of 100.
- (3) Unit cell values (**a**, **b**, **c**, α , β , γ) with uncertainties and units.
- (4) Unit cell volume (**V**) with uncertainty and units.
- (5) A comparison your measurements with values expected for the unit cell of the mineral based on published data.
- (6) If the unit cell data provide information about the mineral's chemistry, you should interpret your data accordingly.

As an appendix to your report, please include:

- (1) A copy of the output from the unit cell refinement program.
- (2) A copy of the PDF file(s) used to assign (hkl) values to your peaks by comparison.