Geology 222b Laboratory

"Granites"

1. Examine one rock from each of the following three groups. Describe the hand specimen including texture, mineralogy, and field name. Describe the thin section including mineralogy, estimated mode, IUGS classification, grain size, texture, etc. A labeled photomicrograph would improve your description, but is not required. Prepare a short summary for each rock with this information. Be sure to include brief reasons (color, form, optical data, texture, etc.) for your mineral identifications. Lab reports may be submitted as files via the Blackboard dropbox, or in hard copy form.

   (a) *JB-10 or *WS-19

   (b) *W-11 or *W-12

   (c) *JB-8 or *WS-13

   (Note: The dark minerals in group (c) are aegirine (=augite with acmite) and arfvedsonite (=hornblende with riebekite.)

2. Each of the three rock groups listed above is a qualitatively-different "granite" because it has different minerals. Based on the observed **mineralogy**, it is possible to predict **chemical** differences among these specimens. The results of your norm calculations can help you see these differences. In fact, each of the three rock groups is similar to one of the three chemical analyses we have used in norm calculations (Average Crust, Quincy Granite, and El Capitan). However, remember that the granites are plutonic rocks and may contain hydrous minerals that are not included in the norm calculation, which is anhydrous. See if you can figure out which rock group matches which chemical analysis type. You will need to consider the chemical compositions of any minerals in the granites that are not in the norm. What minerals would be in the norm instead of the hydrous minerals? One of the rocks is subalkaline or “normal”; one is peralkaline; one is peraluminous. Which is which and why?

3. To which of the three groups (peralkaline, subalkaline, peraluminous) do the following hand samples belong? Explain the reason for your choice.

   J-18 (NH granite gneiss – weakly metamorphosed)
   SN-9 (Sierra Nevada Batholith)