LAB 3
TEXTURES AND CRYSTALLIZATION SEQUENCES IN GRANITOIDS
This lab is designed to introduce you to textures and crystallization sequences which can be related to binary phase diagrams.

Part I. Petrographic studies

1. Describe and classify the following samples (fill out pages 1-2 of the three-page Sample Description worksheet:

   1) 214/s-390b
   2) L-32-1
   3) 214/s-349b
   4) 214/s-22a***

***For this rock you do not need to provide modal% (only mineralogy) or plagioclase composition. Refer to question 4.

   As you do so, make note of the features that will help you answer the following questions.

   a) Look for many of the following features that can be related to binary phase diagrams:
      
      o Zoning
      o Exsolution textures
      o Myrmekitic texture
      o Poikilolitic texture
      o Textures that may reflect reaction relationships (e.g., one mineral enclosing another mineral preferentially as in reaction rims)
      o Other textures (phaneritic, aphanitic, porphyritic, hypidiomorphic, pandiomorphic, allotriomorphic, alteration, sieve, glomercrysts)

   b) Determine as best you can the crystallization sequence for the ferromagnesian phases and for the quartzofeldspathic phases using crystal morphology and inclusion-relationships. Some rocks will be more definitive than others.

   c) Bracket the compositional ranges of the plagioclase feldspars in each sample.

   d) Record your observations for the rocks in the summary chart.
2. Study sample 5) 214/s-78e. What type of texture do you observe in the K-feldspar phenocrysts (from the list in question 1)? Make an illustration of the texture.

Provide the illustration and texture name in the summary page.

3. Study sample 6) 90SN30. Compare the mineralogy of sample 90SN30 to sample 1) L-32-1 by finding two minerals in sample 90SN30 which are uncommon or not present in L-32-1.

Which sample is peraluminous? Why is this sample peraluminous?

Note that peraluminous granitoids, sometimes also called “S-type” granitoids, are not very common.

Record your answers on the summary page.

4. Study sample 4) 214/s-22a. Describe the process by which this rock formed.

Record your answer in the summary page.

5. Study hand sample 214/s-85e and hand sample “X”. Note the texture in these rocks and describe how it formed.

Record your answer in the summary page.
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Major Minerals</th>
<th>Textural Features (listed on page 1)</th>
<th>Crystallization Sequence for Ferromagnesian Minerals</th>
<th>Crystallization Sequence for Quartzofeldspathic Minerals</th>
<th>Plagioclase Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) 214/s-390b</td>
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<td>2) L-32-1</td>
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<tr>
<td>2) 214/s-349b</td>
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<td>4) 214/s-22a</td>
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Lab 3 Summary Page

Question 2:
Texture in sample 6) 214/s-78e

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Question 3:
Minerals in sample 6) 90SN30 which are not found in 1) L-32-1:
1. ________________
2. ________________

Which sample is peraluminous? ______________________

Why is this sample peraluminous?
__________________________________________________
____________________________________________________________________________________________________________

Question 4: Describe the process by which sample 4) 214/s-22a formed.

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____________________________________________________________________________________________________________
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4 of 5
Question 5:
Name of texture: ______________________
Describe the process by which samples 214/s-85e and “X” formed.

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