

### 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:
  - Zoning
  - Exsolution textures
  - Myrmekitic texture
  - Poikilitic texture
  - Textures that may reflect reaction relationships (e.g., one mineral enclosing another mineral preferentially as in reaction rims)
  - 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.

**Lab 3 Summary Chart**

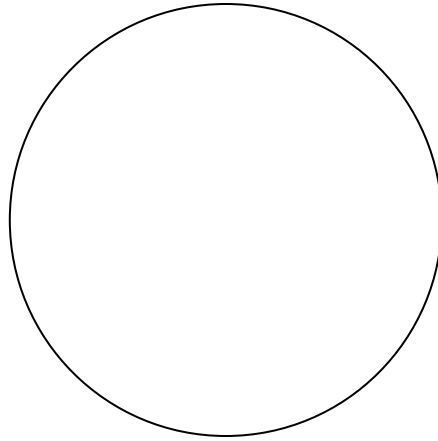
	Field Name	Major Minerals	Textural Features (listed on page 1)	Crystallization Sequence for Ferromagnesian Minerals	Crystallization Sequence for Quartzofeldspathic Minerals	Plagioclase Composition
1) 214/s-390b						
2) L-32-1						
2) 214/s-349b						
4) 214/s-22a						

**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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Question 5:

Name of texture: \_\_\_\_\_

Describe the process by which samples 214/s-85e and "X" formed.

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