

## Sumptuous Textures

You now know how to identify the major rock-forming minerals. In this lab, you will nurture these skills by looking at the interaction of different phases in rocks. This is useful because it tells you a lot about the history of the rock - magmatic, post-magmatic, or both. The purpose of this lab is to introduce to the vast textural lexicon, and more importantly, to practice making simple textural observations in hand sample and under the scope with the hopes of elucidating some of the processes responsible for creating rocks. Three sections - hand samples, thin sections, and some with both.

### Hand Samples:

**I5- 018** – Anorthosite (labradorite) - What is the texture?

**IU-60 (488)** – Olivine basalt showing aphanitic texture.

**I14-05** – Andesite porphyry – you guessed it, porphyritic texture. Identify the phenocrysts.

**1709 (IU-40)** – Identify the phenocryst and describe the texture.

**IU-31 (1826)** – Identify the rock and texture. Compare and contrast this sample with IU-60. If these rocks came from the same outcrop, what could you say about their relation to one another?

**I1-028** – Identify the major phases in this rock, describe its texture, and give it a name. The texture of this rock allows you to determine the crystallization sequence for some of the major phases. It also exhibits what is called rapakivi, texture in which plagioclases is rimming k-spar. What does the crystallization sequence and the presence of rapakivi texture tell you about the magmatic history of this rock?

**#3** – Identify the phases and texture (hint: You saw it two labs ago in thin section).

**HI!** – Anorthosite (labradorite) - What is its texture?

**B1a, b** – Describe the texture of each of these rocks and identify the phenocrysts. What is the relationship between *a* and *b*?

**B2a,b,c** – A day in the life of pumice. Here are examples of three rocks of nearly identical compositions, but with completely different textures. The textures of these rocks tell you A LOT about the history of these rocks. Describe the texture of each, name the rocks and tell me how they may be related to each other in terms of the volcanic processes that formed them. (for reference, thin section 84-5b could easily be placed in the same sequence)

**#6** – Holocrystalline granite with an inclusion. Is the inclusion a xenolith or cognate?

**Cube** – another example of a holocrystalline granite.

**FOLD!** – that's right, it's a fold. What would you name this rock? What is the texture(s)? Is it a primary or a secondary feature?

### **Thin Sections:**

**IU-9** – Plagioclase and pyroxene (aegerine) showing subophitic texture. What does this texture tell you about the magmatic history of the rock?

**IU-31** – Another example of subophitic texture. Identify the major phases.

**SC-19 (IG-19)** – This section is a mediocre example of phenocryst resorption and a good example of microlites. Explain what you can deduce from the presence of resorbed phenocrysts.

**I14-06** – Here is an example of a completely crappy altered rock that has retained very little of its primary mineralogy, but preserves original igneous texture. What is the texture, and what do you think the large phenocrysts are (were).

**SC-26 (IG-26)** – Corona texture. The biotite phenocrysts are rimmed by very fine-grained crystals, most likely hornblende. The corona can best be seen in plane light. It also contains beautifully zoned plagioclase. What do these two observations tell you about the magmatic history of this rock?

**IU-66** – Diktytaxitic texture. Describe the texture and sketch an example.

**84-5b** – This is a fresh ignimbrite (ash flow tuff). Note the glass, the vesicles, and the phenocrysts.

### **Hand samples with thin sections:**

**IU-5** – Alkali Syenite – Displays macroscopic trachytic texture and microscopic hypidiomorphic texture. Identify the major phases and say why I am calling it trachytic texture and not pilotaxitic.

**SC-10 (468; IG-10)** - What is this thing? Tell me how it formed.

**SC-9 (IG-9)** – Welded tuff. This is a sample of an ash fall that was compressed and reheated to weld it. Note that in hand sample, the primary igneous texture is visible and preserved, while in thin section it is completely devitrified and unrecognizable.

**IU-72 (410)** – Porphyritic andesite with pilotaxitic texture. Identify the phenocrysts, describe the texture and sketch what you see in the field of view. What's an andesite, anyways?

**IU-52 (1660)** – Identify the phases present and the texture.

**SC-3 (IG)** – Look at the hand sample first. Describe the texture and identify the phenocrysts. Now look at the thin section. Is there anything you missed or misidentified? (be honest or go home).

**SC-21 (IG-21, 625)** – A trachyte with microlitic texture. What phase are the microlites? Are they useful for anything? What is a trachyte?

**835 (handsample), SC-8 (IG-8; thin section)** – Obsidian showing spherulitic texture. Note the flow banding in handsample. What is the difference between obsidian and basalt?