

Petrology - Fall 2006
Quiz #1

For this quiz you may use any notes you have but no books.

Short answer questions:

1. How can you tell an extrusive from an intrusive rock? Assume you have both a thin section and a hand specimen.

2. What sorts of minerals do you expect to find in silicic igneous rocks? Why? Be specific. Name some. Which ones are key?

3. What sorts of minerals do you expect to find in intermediate igneous rocks? Why? Be specific. Name some. Which ones are key?

4. What sorts of minerals do you expect to find in mafic igneous rocks? Why? Be specific. Name some. Which ones are key?

5. Alas, some minerals don't always behave. You might even see a misbehaving goofy rock today. For instance, there are rocks that fall in the basalt category but also contain biotite. This is not expected. There are also rocks that seem to be granites – based on feldspar and quartz content – but contain olivine. Explain how these oddball rocks can exist. Why don't they have the normal and expected mineralogy?

6. Some minerals have high birefringence. What does the term birefringence mean? How, using a microscope, can you identify minerals with high birefringence?

7. Some minerals appear to have high relief in thin section. What does this mean? What causes minerals to have different amounts of relief?

8. When you look at crystals of hornblende in thin section, some may appear to have two sets of cleavage at $60-120^\circ$. We like this because it helps identify hornblende – to distinguish it from other mafic minerals. But other grains may only show 1 cleavage. Why? Explain.

9. Some minerals in thin section will show pleochroism. What does that mean? Why do some minerals show pleochroism?

10. Some minerals in thin section appear euhedral. Some appear subhedral. Some appear anhedral. For example, quartz and K-feldspar are typically anhedral. Olivine and plagioclase are often euhedral. Why? Why are some minerals more likely to be euhedral than others?

Now for the rock specimens. Consider samples: 102

1. Is this an extrusive or an intrusive rock?
 2. Is this a mafic, intermediate or silicic rock?
 3. List all the major minerals in the rock and estimate rough percentages.
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4. Name the rock.

Sample #128

1. Is this an extrusive or an intrusive rock?
 2. Is this a mafic, intermediate or silicic rock?
 3. List all the major minerals in the rock and estimate rough percentages.
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4. Name the rock.

Sample #115

1. Is this an extrusive or an intrusive rock?
2. Is this a mafic, intermediate or silicic rock?
3. List all the major minerals in the rock and estimate rough percentages.

4. Name the rock.

Sample #117

1. Is this an extrusive or an intrusive rock?
2. Is this a mafic, intermediate or silicic rock?
3. List all the major minerals in the rock and estimate rough percentages.

4. Name the rock.

Sample #130

1. Is this an extrusive or an intrusive rock?
2. Is this a mafic, intermediate or silicic rock?
3. List all the major minerals in the rock and estimate rough percentages.

4. Name the rock.

Sample #122

1. Is this an extrusive or an intrusive rock?
2. Is this a mafic, intermediate or silicic rock?
3. List all the major minerals in the rock and estimate rough percentages.

4. Name the rock.