

GLY261 Practicals 7 & 9: Intrusive Mafic Rocks

Name: _____ **Student Number:** _____

Several sections of different mafic intrusive rocks are available in the microscope lab. Over this Thursday and next Thursday, work on 3 different sections, describing them fully and detailing their paragenetic sequences. Due 15 August 5pm.

Section 1

1. What is the section name? _____

2. What minerals are present?

Mineral 1: _____ %

Mineral 2: _____ %

Mineral 3: _____ %

Mineral 4: _____ %

Mineral 5: _____ %

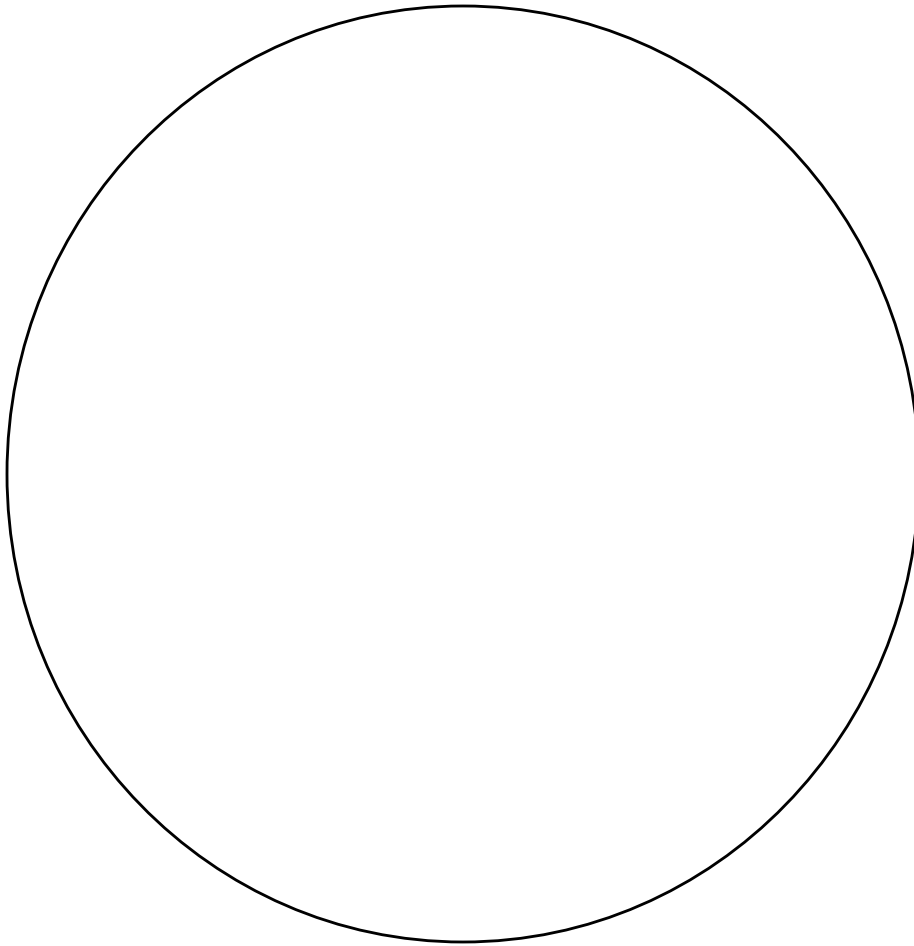
Mineral 6: _____ %

3. What is the correct name for the rock based on these percentages?

4. Describe the textures of the minerals using the attached terminology sheet:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5. Sketch a portion of the thin section, chosen to show the important textural relationships:



6. Which minerals formed in which order, and why do you say so?

Section 2

1. What is the section name? _____
2. What minerals are present? _____

Mineral 1: _____ %

Mineral 2: _____ %

Mineral 3: _____ %

Mineral 4: _____ %

Mineral 5: _____ %

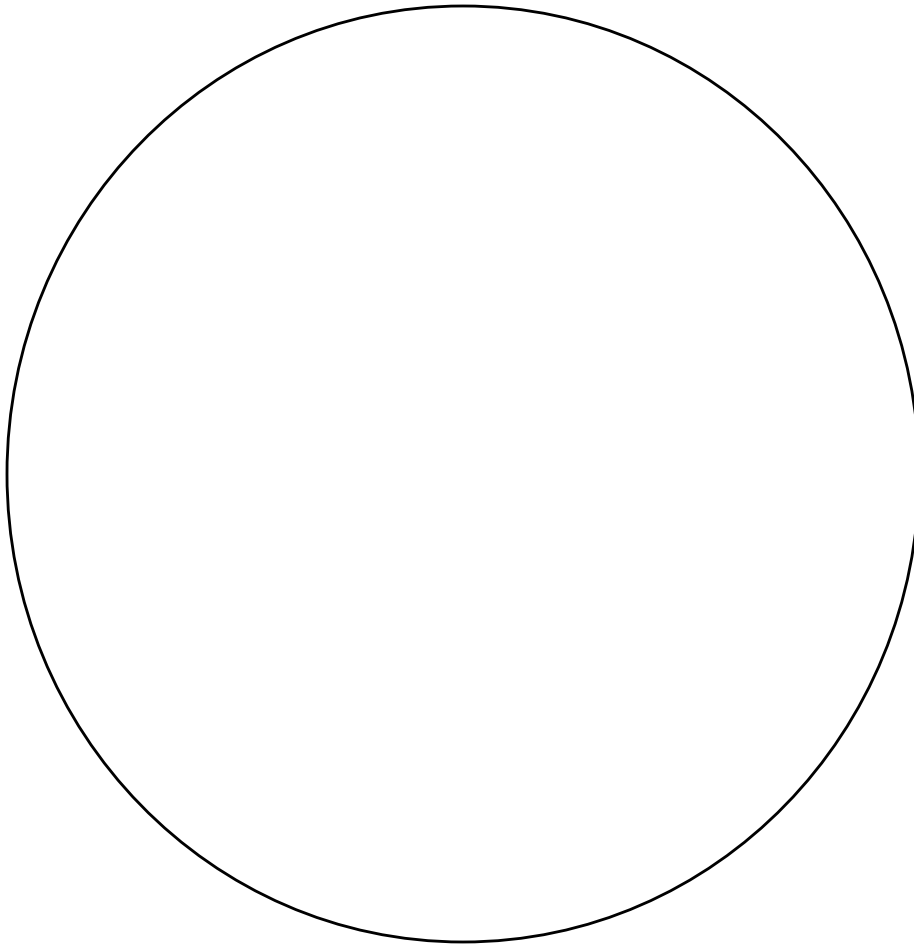
Mineral 6: _____ %

3. What is the correct name for the rock based on these percentages?

4. Describe the textures of the minerals using the attached terminology sheet:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5. Sketch a portion of the thin section, chosen to show the important textural relationships:



6. Which minerals formed in which order, and why do you say so?

Section 3

1. What is the section name? _____
2. What minerals are present? _____

Mineral 1: _____ %

Mineral 2: _____ %

Mineral 3: _____ %

Mineral 4: _____ %

Mineral 5: _____ %

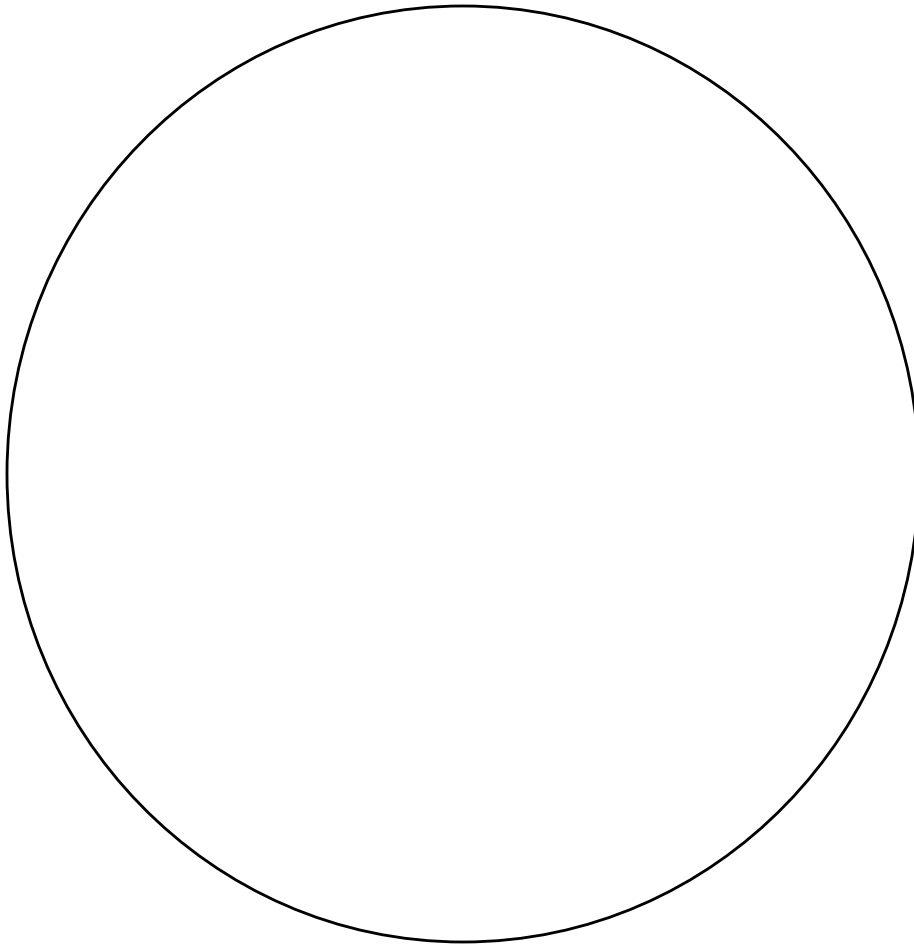
Mineral 6: _____ %

3. What is the correct name for the rock based on these percentages?

4. Describe the textures of the minerals using the attached terminology sheet:

This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, text, or other markings on the page.

5. Sketch a portion of the thin section, chosen to show the important textural relationships:



6. Which minerals formed in which order, and why do you say so?

Textural terms for Igneous Rocks- GLY 261 Practicals

Crystallinity: A rock can be composed solely of crystals (*holocrystalline*) or completely composed of glass (*holohyaline*). Rocks of intermediate composition are *hypocrystalline* or *holocrystalline*. Used with **volcanic** rocks

Granularity: *Phaneritic* rocks contain crystals of sufficient size they can be seen in hand specimen (or on the glass slide). *Aphanitic* rocks have crystals that are too small to be seen in hand specimen. Aphanitic rocks can be either *microcrystalline* (crystals can be seen under the microscope) or *cryptocrystalline* (crystals too small even for the microscope).

Coarse-grained:	>5mm
Medium-grained:	1-5mm
Fine-grained:	<1mm

Relative crystal sizes: If all the crystals are roughly the same size, the rock is *equigranular*. If the crystals are of different sizes, the rock is *inequigranular*, and may have one of the following textures:

- 1) A *porphyritic* rock consists of large crystals (*phenocrysts*) embedded in a finer-grained groundmass. Both crystal occurrences can be of the same mineral.
- 2) A *seriate* rock consists of a wide range of crystal sizes, rather than just the bimodal distribution in a porphyritic rock.
- 3) *Glomeroporphyritic* rocks comprise clumps of phenocrysts in a finer groundmass.
- 4) *Poikilitic* rocks consist of crystals that completely enclose other crystals. The enclosing crystal is an *oikocryst*, the enclosed crystal is an *chadacryst*.
- 5) *Ophitic* texture refers to a variety of poikilitic rock, in which the chadacrysts are generally elongate, but randomly arranged.

Crystal shape:

Euhedral /idiomorphic crystals show characteristic crystal faces.

Anhedral/ allotriomorphic crystals show no characteristic faces.

Subhedral /hypidiomorphic crystals show some characteristic faces.

Equant crystals are roughly the same size in all directions.

Inequant crystals have a distinct shape, with differing dimensions. Examples include, from most equant to least equant:

Tabular or platy

Lamellar

Bladed

Columnar

Acicular or needle-like

Other crystal shapes:

Skeletal crystals have hollows or gaps in their structure

Dendritic crystals show a tree-like structure

Embayed crystals are crystals that appear broken open and intruded into by the groundmass.

Parallel growth of minerals can occur.

Other terms

Sieve texture: refers to the intergrowth of glass and crystals

Elongate, branched or curved crystals: can occur in volcanic rocks, or magmas in which flow occurred.

Pseudomorph: Some crystals can be completely replaced by another mineral, leaving the original crystal shape intact.

Interstitial: Some crystals are developed in the spaces between the phenocrysts, with little or no connection between the spaces.

Intergranular: Pyroxene, olivine or other mafic minerals are found in the interstitial spaces between plagioclase or k-feldspar laths.

Trachytic: Feldspars are arranged in a sub-parallel arrangement.

Exsolution: Lamellae or blebs of one mineral exsolve in another mineral. Ilmenite in magnetite is one example.

Spherulitic: Numerous elongate crystals growing outward from a nucleus.

Variolitic: A fan-like structure branching out from a nucleus.

Overgrowths/ Coronas: Another mineral has grown over the top of a previously existing material.

Zoning: clear zones can be seen within a single crystal.

Feldspar-related textures

Granophyric: K-feldspar and plagioclase are intergrown.

Myrmekitic: Plagioclase and quartz are intergrown.

Lamellar texture: blebs or “lamellae” of one type of feldspar are found in another feldspar- *perthitic* texture comprises plagioclase in k-feldspar, *antiperthite* comprises k-feldspar in plagioclase.