ESS103A Name_____
Igneous Petrology, Spring 2006

LAB 4
MAFIC AND ULTRAMAFIC INTRUSIVE ROCKS
FROM THE STILLWATER INTRUSION

This lab is designed to introduce you to textures and crystallization sequences of mafic and ultramafic rocks that can be related to binary and ternary phase diagrams.

1. Describe and classify the following samples using page one of the three-page worksheet:

    1) 254/L-2-8 (739)
    2) 254/L-11-6
    3) 254/L-11-10
    4) 254/L-11-11

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

    a) Look for the following features:

        - Cumulate vs noncumulate rocks
        - Cumulus and postcumulus minerals/liquid
        - Orthocumulate
        - Mesocumulate
        - Adcumulate
        - Oikocryst
        - Reaction Rim
        - Exsolution
        - Hypidiomorphic granular, pandiomorphic granular, allotriomorphic granular

    b) These rocks are all cumulates. Determine, <u>as best you can,</u> which phases are cumulate and which are postcumulate.

    c) Record your observations for the rocks in the summary data table.

2. Study sample 5) **254/L-11-17**. Find evidence of a reaction rim and make an illustration of this texture. Describe the relationship of the minerals (what's in the core and what's on the rim). Considering the Fo (Mg_2SiO_4)-Qz (SiO_2) T-X diagram, where would this texture form (eutectic, cotectic, pertitectic)?

    Record your answers on the summary page.

3. Study sample 6) **254/L-11-2**. Is this a cumulate or noncumulate rock? What type of texture do you observe in some of the pyroxene phenocrysts (from the list in question 1)?

   Record your answers on the summary page.

4. Study samples 7) **254/L-2-11** and 8) **254/L-11-12**. These are other rocks from the Stillwater intrusion that are quite similar to rock that you've seen before. What names would you give them based on mineralogy? (Could you identify them just from the hand-specimen?)

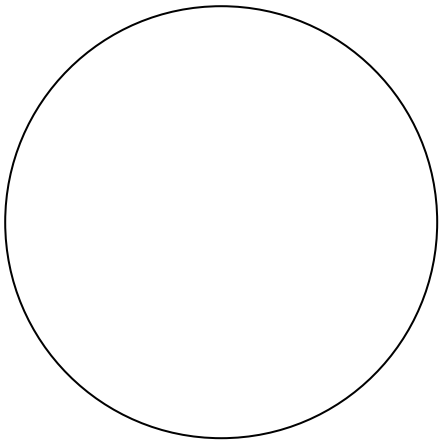
   Record your answer on the summary page.

Lab 4 Summary Chart

	Field Name	Mafic or Ultramafic	Major Minerals	Textural Features (from list on pg. 1)	Cumulate Minerals (crystallized first)	Postcumulate Minerals (crystallized second)
1) 254/L-2-8 (739)						
2) 254/L-11-6						
3) 254/L-11-10						
4) 254/L-11-11						

Lab 4 Summary Page

Question 2



Reaction rim in 5) 254/L-11-17

Describe relationship of minerals: _____

_____

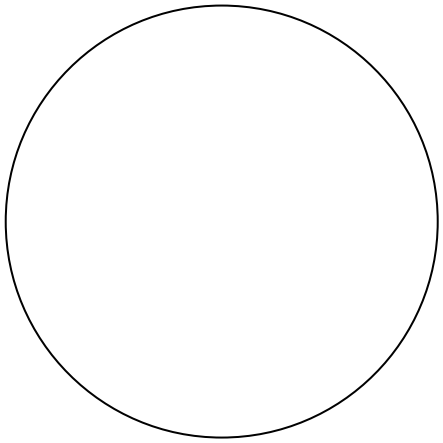
_____

_____

Considering the Fo (Mg_2SiO_4)-Qz (SiO_2) T-X diagram,

where would this texture form: _____

Question 3



6) 254/L-11-2

Cumulate or noncumulate rock: _____

Texture in pyroxene: _____

Question 4

7) 254/L-2-11

Rock name _____

8) 254/L-11-12