

**Petrology 2003**  
**Quiz #1**

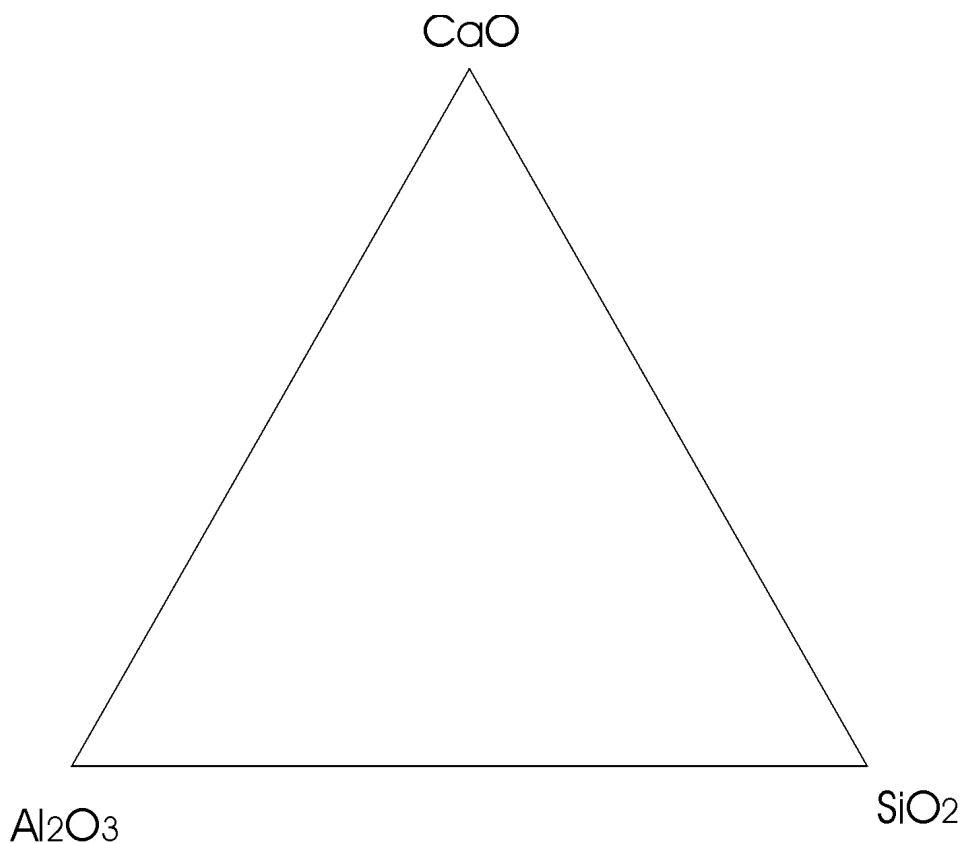
1. On the triangle below, plot the compositions of:

grossular =  $\text{Ca}_3\text{Al}_2\text{Si}_3\text{O}_{12}$

quartz =  $\text{SiO}_2$

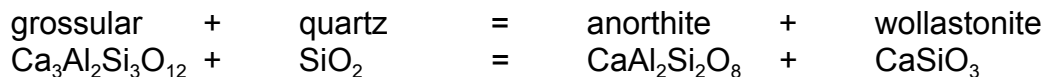
anorthite =  $\text{CaAl}_2\text{Si}_2\text{O}_8$

wollastonite =  $\text{CaSiO}_3$



(You can draw in grid lines if you wish or do it the other way.)

2. Balance the reaction:



On your diagram draw a (tie) line between the reactants (grossular and quartz), and another one between the product (anorthite and wollastonite). They should cross. This is one type of reaction involving four phases in a three component system. It is called a "crossing tie-line" reaction.

Give brief but clear definitions for each of the following:

3. pyroclastic
4. porphyritic
5. phenocryst
6. phaneritic

I looked up the optical properties of three minerals and give the results below.

7. Why are there different amounts of data for fluorite, pigeonite and scapolite? Explain so that I know you really know why.

Questions 8-15: Explain what each line of data means in the space provided.

mineral and data	What does it mean?
------------------	--------------------

fluorite

n=1.434	8.
---------	----

pigeonite

(+)	9.
2V=0 to 32°	10.
$\alpha=1.682-1.722$ $\beta=1.684-1.722$ $\gamma=1.705-1.751$	11.
$\delta=0.023-0.029$	12.

scapolite

(-)	13.
$\epsilon=1.537-1.557$ $\omega=1.539-1.596$	14.
$\delta=0.002-0.004$	15.

16. Which of the above minerals has the highest order interference colors?

**In the lab part**

There is a box with four (if none are being used by anyone) thin sections and no hand specimens. Take any thin section from the box of four - they are all the same - and examine it and answer the questions below.

There are also five boxes that each contain one rock and one thin section. Choose any one and answer the same questions. Be sure to write down the sample number so we know which one you looked at!

Questions:

-What are the major minerals present and in what relative amounts?

(If you see a mineral and know it is different from others that are there, but you don't know what it is, then give a good description. After that, guess what it is if you wish. But, a good description will get you points.)

-What is a good name for this rock?