

1. a. The mineral omphacite is a pyroxene that is intermediate in composition between jadeite ( $\text{NaAlSi}_2\text{O}_6$ ) and diopside ( $\text{CaMgSi}_2\text{O}_6$ ). Calculate the composition in weight percent oxides of an omphacite that is 60 mol percent diopside and 40 mol percent jadeite.

$\text{SiO}_2$   
 $\text{Al}_2\text{O}_3$   
 $\text{MgO}$   
 $\text{CaO}$   
 $\text{Na}_2\text{O}$

- b. Calcium Tschermaks pyroxene ( $\text{CaAlAlSiO}_6$ ) forms complete crystalline solution with diopside ( $\text{CaMgSi}_2\text{O}_6$ ). Calculate the composition in weight percent oxides of a pyroxene that is 50 mol percent C-Tschermaks pyroxene and 50 mol percent diopside.

$\text{SiO}_2$   
 $\text{Al}_2\text{O}_3$   
 $\text{MgO}$   
 $\text{CaO}$

2. Plagioclase feldspars are intermediate in composition between end-members anorthite ( $\text{CaAl}_2\text{Si}_2\text{O}_8$ ) and albite ( $\text{NaAlSi}_3\text{O}_8$ ). Listed below are two plagioclase feldspar analyses. Calculate the mole percentages of the end-members for each.

$\text{SiO}_2$	48.07
$\text{Al}_2\text{O}_3$	33.37
$\text{CaO}$	16.31
$\text{Na}_2\text{O}$	<u>2.25</u>
	100.

$\text{SiO}_2$	59.45
$\text{Al}_2\text{O}_3$	25.70
$\text{CaO}$	7.33
$\text{Na}_2\text{O}$	<u>7.52</u>
	100.