

GEOL 2163**MINERALOGY I****Professor: Dr. Paula C. Pilonen****MIDTERM EXAM***Thursday, October 10th, 2002*Dept. of Earth Sciences, University of Ottawa

NAME: _____**STUDENT #:** _____**Time allotted: 1.5 hours****Calculators are permitted****Total Marks: /67**

Question #1. What is a mineral? (6 marks)

Question #2. Compare *and* contrast the following terms (3 marks each):

a) Orthorhombic and monoclinic

b) Open and closed form

c) Point group and space group

d) Hydrogen bonding and Van der Waals forces

e) (010) and [010]

f) Dome and sphenoid

Question #3. Define the following terms (2 marks each):

a) Monoclinic crystal system

b) Electronegativity

c) Metamict mineral

d) Holohedral

e) Hermann-Mauguin notation in the hexagonal crystal system (e.g. 6/m 2/m 2/m)

Question #4. An experiment is carried out to determine the melting points of the following minerals:

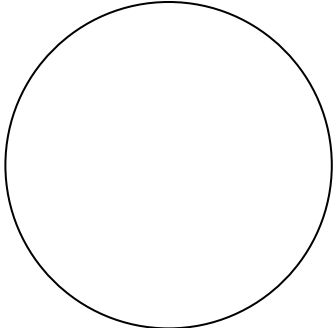
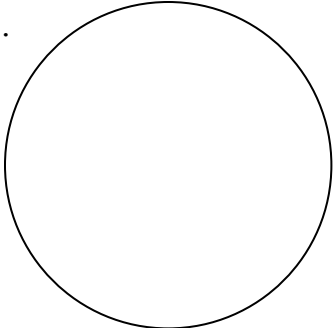
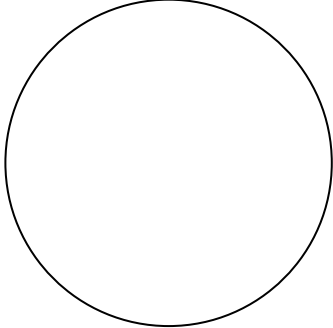
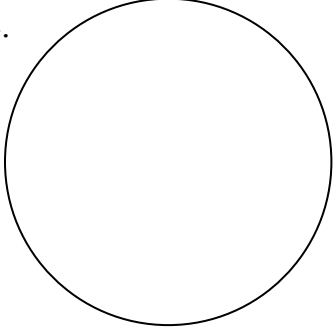
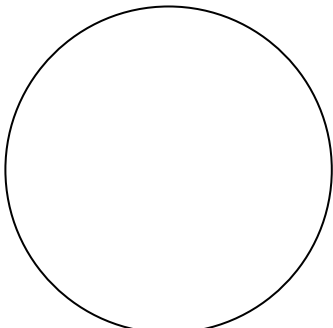
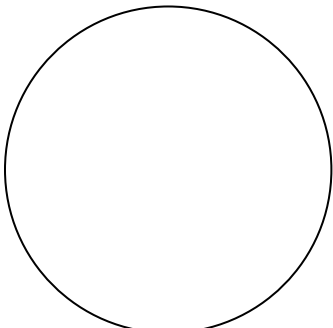
<u>Mineral</u>	<u>Interionic Distance</u>
CaF ₂	2.42 Å
MgF ₂	2.15
MnF ₂	2.32
BaF ₂	2.80

Predict, from lowest to highest, what the trend in melting points will be for these minerals (*i.e.* which will have the lowest/highest melting point). Explain why. (5 marks).

Question #5.

Question #6. Define covalent and ionic bonding. Will the presence of covalent bonding in crystals tend to increase or decrease symmetry? Why? (5 marks)

Question #7. Plot the following point groups on the stereonetets provided. Make sure to distinguish between mirror planes and rotational axes by either colour, dashes or width of the lines. (3 marks each)

1.		2.	
	mm2		622
3.		4.	
	$\bar{4}2m$		32
5.		6.	
	4/m2/m2/m		2/m